

QR
117
B293
BOT

ISSN 0198-7356

BARTONIA

JOURNAL OF THE PHILADELPHIA BOTANICAL CLUB

philbotclub.org

No. 70

CONTENTS

A Revised Checklist of the Lichenized, Lichenicolous and Allied Fungi of New Jersey	DENNIS P. WATERS AND JAMES C. LENDEMER	1
The Philadelphia Botanical Club—Its Role in Citizen Science and an Index to Local Floristic Reports Published in Its Journal, <i>Bartonia</i>	DAVID A. HEWITT AND KENNETH D. FRANK	63
News and Notes First Record of <i>Magnolia macrophylla</i> Michx. as a Casual Alien in Pennsylvania	MARION ANDREWS HOLMES AND DAVID A. HEWITT	91
New Allegheny County, Pennsylvania Occurrences for <i>Crataegus chrysocarpa</i> and <i>Geranium dissectum</i> Plus the Rediscovery of <i>Sherardia arvensis</i>	JOSEPH C. MANNINO, RYAN M. UTZ AND BONNIE L. ISAAC	93
Bayard Long Awards for Botanical Research and Philadelphia Botanical Club Grants for Botanical Research, Education, and Conservation		95
2015 and 2016 Field Trips		99
Program of Meetings: January 2016 – May 2018		131

PUBLISHED BY THE CLUB
ACADEMY OF NATURAL SCIENCES, 1900 BENJAMIN FRANKLIN PARKWAY
PHILADELPHIA, PENNSYLVANIA 19103-1101
ISSUED 15 MAY 2019



BARTONIA

Journal of the Philadelphia Botanical Club

Since its founding in 1891, the Philadelphia Botanical Club has offered outstanding programs, field trips, and other opportunities for those with an interest in plants to meet and exchange information. Monthly meetings (www.philbotclub.org/meeting.html) feature speakers from various botanical backgrounds. They are held at 7:30 p.m. on the fourth Thursday of the month in September, October, and January through May and the third Thursday in November and December, usually at the Marvin Comisky Conference Center, One Logan Square (one block east of the Academy of Natural Sciences of Drexel University). From April to October, expert field botanists lead field trips in the mid-Atlantic region and occasionally elsewhere in North America or overseas (www.philbotclub.org/field_trips.html).

Officers

President: Ryan Rebozo (2017-2019)
Vice President: Tatyana Livshultz (2009-2019)
Treasurer: Ken Frank (2013-2019)
Corresponding Secretary: Janet Novak (2014-2019)
Recording Secretary: Joe Rucker (2012-2019)

Other Members of the Executive Committee:
David Hewitt, William H. Roberts,
Terry L. Schmidt
Editor, *Bartonia*: Sasha W. Eisenman

Appointees

Herbarium Curator: Joseph Arsenault (2007-2019)
Program Committee Chair: David Hewitt (2013-2019)
Field Trip Coordinator: Ryan Rebozo (2016-2019)
Herbarium Committee Chair: Ted Gordon (2007-2019)

Endowment Fund Director: John C. O'Herron II (2007-2019)
Environmental Committee Chair: Jason Hafstad (2017-2019)
Constitution Committee Chair: William H. Roberts (2007-2019)

Bartonia, in publication since 1909, was named for William P. C. Barton (1786-1856), Professor of Botany at the University of Pennsylvania and author of the first local flora (1818), *Compendium Florae Philadelphicae* (and nephew of physician and botanist Benjamin Smith Barton, who was a mentor of the explorer Meriwether Lewis). The journal began as an annual abstract of the Club's proceedings with short articles on the plants of the Philadelphia area. Its scope has broadened to encompass original research in plant systematics, plant ecology, and plant conservation biology with articles on floristics, distribution, methods, biography, bibliography, history of botanical exploration, and other topics of botanical interest ranging throughout—and well beyond—the mid-Atlantic region.

Editor: Sasha W. Eisenman

Associate Editors:

Timothy A. Block—Director, Pennsylvania Flora Project, Morris Arboretum, University of Pennsylvania, Philadelphia
John Dighton—Director, Pinelands Field Station and Professor, Rutgers University, New Lisbon, New Jersey
Wayne R. Ferren Jr.—Principal Ecologist, Channel Islands Restoration; Project Ecologist, ARCADIS, Santa Barbara, CA
James Lendemer—The New York Botanical Garden, Bronx, New York
Robert F. C. Naczi—The New York Botanical Garden, Bronx, New York
David B. Snyder—Dept. of Environmental Protection, NJ State Forestry Services, Office of Natural Lands Mgt., Natural Heritage Program

A subscription to *Bartonia* comes with Club membership (annual dues are \$20.00 for regular members, \$10.00 for full-time students) and the cost is \$25.00 per issue for non-members and institutions. For addresses outside the U.S. and Canada, there is a \$7.00 shipping surcharge. The membership year is from 1 January through the following 31 December. The Club is exempt from federal income tax under section 501(c)(3) of the Internal Revenue Code; contributions above the subscription cost are tax-deductible.

Membership/subscription correspondence:

Subscription Manager
The Philadelphia Botanical Club
Botany Department, Academy of Natural Sciences
1900 Benjamin Franklin Parkway
Philadelphia, PA 19103-1195

Manuscript submission:

Sasha W. Eisenman, Ph.D.
Editor, *Bartonia*
Temple University, Dept. of Landscape Architecture and Horticulture
201 Dixon Hall
580 Meetinghouse Road
Ambler, PA 19002
eisenman@temple.edu

A revised checklist of the lichenized, lichenicolous and allied fungi of New Jersey

DENNIS P. WATERS^{1,*} AND JAMES C. LENDEMER²

¹*4 Ivy Glen Lane, Lawrenceville, NJ 08648, U.S.A.*

²*Institute of Systematic Botany, The New York Botanical Garden, Bronx, NY 10458-5126, U.S.A.*

**corresponding author: dpwaters@gmail.com*

ABSTRACT. The first checklist of New Jersey lichens, lichenicolous fungi, and allied fungi treated with lichens (e.g., Mycocaliciaceae) is presented, together with an accounting of excluded species and questionable historical reports. A total of 479 species are reported from the region based on extensive study of herbarium specimens, fieldwork, and records compiled from the published literature cross-referenced with extant herbarium specimens. Prior published work on the lichens of New Jersey is reviewed and discussed, as are avenues for further research. The currently documented biodiversity is discussed from the standpoint of several widely used lichen traits (growth form, reproductive mode, nutrition mode) and datasets derived from biodiversity inventories carried out by the authors are used to illustrate trends in species frequencies.

Keywords. Atlantic Coastal Pine Barrens, biodiversity, conservation, historical baseline, Kittatinny Ridge, Mid-Atlantic Coastal Plain, natural history collections, Piedmont, Pine Barrens, symbiosis.

INTRODUCTION

More than two centuries of continuous study of eastern North American lichens has documented a biologically diverse and ecologically important biota comprising thousands of species that include endemic elements of geographically widespread and narrowly distributed species (Allen & Lendemer 2016, Gueidan & Lendemer 2015, Hale 1987, Lendemer & Allen 2015, Lendemer & Harris 2015, McMullin 2015, Nelsen et al. 2010), disjunct elements that include species from regions such as eastern Asia (Magain et al. 2016; Miadlikowska et al. 2011; Sheard 2010; Sheard et al. 2014, 2017; Spribille et al. 2011) and Europe (Brodo & Hawksworth 1977, Brodo & Vänškä 1984, Culberson & Culberson 1968, Printzen et al. 2003, Sheard 1995), as well as a cosmopolitan element that includes species considered to have large intercontinental distributions (Hale 1976a, Leavitt et al. 2015). Despite having such a long and distinguished history of study however, relatively few areas have been subjected to the systematic, large-scale biodiversity inventories that have already been carried out for organisms such as vascular plants or vertebrates (see Lendemer & Allen 2014, Nash et al. 2002). Further, when such inventories have been carried out, they typically highlight conservation issues and lead to the description of a remarkable number of taxa new to science (e.g., Lendemer et al. 2016b, Lücking et al. 2011, Seavey et al. 2017, Spribille et al. 2010).

As is the case for other areas in the eastern United States, the lichens of the densely populated region between Boston and Philadelphia have been the subject of scientific

inquiry for hundreds of years (Brodo 2000, Fink 1904, Willey 1867). This is not surprising given the rich history of local botanical study and major botanical research institutions (Brendel 1879, Boom 1996, Harshberger 1899, Pennell 1941, Smith 1962, Thomas 2016, Wood 2010). While historical accounts of the lichens in this area were largely synoptic checklists incorporated into floras (e.g., Darlington 1853, Halsey 1823, Heller 1893, Muhlenberg 1813), large-scale inventories have been carried out in modern times in areas such as the Boston Harbor in Massachusetts (LaGreca et al. 2005), Long Island in New York (Brodo 1968) and Pennsylvania (Lendemer 2011a). Yet, substantial knowledge gaps remain and among these is the State of New Jersey.

The lichens of New Jersey, as a whole, have neither been systematically inventoried nor the subject of a single focused publication. Although a synoptic checklist of New Jersey lichens was published by Britton (1889), this list was based on material collected at limited locations by a relatively small number of researchers and is now substantially outdated as it is more than a century old. Likewise, while Wood (1914) enumerated the lichens found throughout a large portion of the state, these records were included with those from other adjacent states because the study was on areas within 100 miles of New York City. Evans (1935, 1938, 1940) documented the diversity of the charismatic genus *Cladonia* in New Jersey, however again these publications did not treat the numerous other lichens that occur in the state. Aside from the aforementioned works, all published accounts of New Jersey lichens have been geographically and taxonomically limited in scope (e.g., Harris 1985, Hastings 1940, Lendemer 2006, Moldenke 1944) or were focused on scientific areas such as ecology rather than floristics (e.g., Glenn & Webb 1997, Glenn et al. 1998, Little 1951, Lutz 1934, Sedia & Ehrenfeld 2006).

The above is surprising given the close proximity of New Jersey to institutions that have long employed lichenologists and maintained substantial lichen collections (Lendemer & Harris 2016a). It is also surprising given that, like adjacent areas of the eastern United States, the lichens of New Jersey have been studied sporadically for more than a century and thus a wealth of largely unpublished data is already housed in natural history collections. Recently, while preparing an account of a lichen biodiversity inventory of Mercer County (Waters & Lendemer, in rev.), we were struck by the absence of a modern checklist of New Jersey lichens. This prompted us to prepare the present contribution.

METHODS

Literature Review. – A comprehensive compilation of lichens and allied fungi previously reported from New Jersey was assembled from two sources: 1) a search for publications indexed in *Recent Literature on Lichens* (Culberson et al. 2017) that had been tagged with the keyword “New Jersey”; and 2) a review of the first 400 results of a Google Scholar search for papers containing “lichen” and “New Jersey.” Each publication was examined and all of the names of taxa reported therein were compiled into a single table that also cited the source and year of publication. These reports were then supplemented by further references found linked to the target publications or through additional opportunistic searches of relevant taxonomic literature. We also incorporated records from Waters & Lendemer (in rev.) as exclusion of the large number of species that will be reported in that contribution would have rendered the present checklist obsolete in a short time frame. It should be noted that our compiled literature reports only included taxa explicitly reported from New Jersey. For example, Nash (1972) and Wetmore (1987) provided lists of species

found near the Delaware Water Gap, which straddles the border between New Jersey and Pennsylvania, but they did not distinguish which state their records were derived from.

The nomenclature used in the original reports was then updated following Esslinger (2016). In the case of some older reports, largely from the 19th century, the names used were not present in the aforementioned reference and as such we relied on Index Fungorum to guide the nomenclatural updates. In order to provide transparency to this process a translation table was prepared and appended to the end of the checklist. The compiled list of reports and updated names was then examined in detail and parsed into three categories: 1) *checklist names*: names derived from reliable records published in modern times (e.g., Harris 1985, Lendemer 2006); 2) *synonyms and excluded species*: names derived from records that were misidentified, correspond to species that are very unlikely to occur in New Jersey (e.g., published modern range maps that do not include the region), or represent well-documented taxonomic synonyms; and 3) *questionable records*: names derived largely from historical records whose occurrence in New Jersey is possible, but the identity of the source voucher material should be examined and confirmed before the species is added to the checklist. In many cases, the names included in the latter two groups were reported by Britton (1889) or Wood (1914) and based on historical collections made by early New Jersey collectors such as C.F. Austin and J.B. Ellis. In an effort to elucidate how these historical reports corresponded to current taxonomic concepts we attempted to locate as many of the original source vouchers as was possible. When such specimens were located, they were examined as outlined in the proceeding section.

Herbarium Study. – This study is largely based on material in the herbarium of the New York Botanical Garden (NY) and voucher data for all NY specimens examined can be accessed via the C.V. Virtual Herbarium at NY (<http://sweetgum.nybg.org/science/vh/>). All specimens were initially studied dry using an Olympus SZ-STB dissecting microscope. Microscopic morphology and anatomy was then studied using an Olympus BX53 compound microscope and sections prepared by hand with a razor blade and mounted in water or iodine. Chemistry was studied using standard spot tests (K, C, KC, P, UV) following Brodo et al. (2001) and supplemented by Thin Layer Chromatography (TLC) using Solvent Systems A and C following Culberson and Kristinsson (1970) but as modified for the peanut butter jar by Lendemer (2011b).

RESULTS AND DISCUSSION

Historically, botanical interest in New Jersey has focused on the Pine Barrens in the south and the Kittatinny Ridge near the Delaware Water Gap in the northwest (Brendel 1879, Britton 1899, Keller & Brown 1905, Stone 1911). Lichenology has generally followed this pattern as is evidenced by the number of collections per county (Figure 1), and by the foci of published studies (Harris 1985, Harris & Lendemer 2006, Forman 1998, Lendemer 2006, Little 1951, Niering 1953). Indeed, of the 9,836 New Jersey lichen collections indexed in the Consortium of North American Lichen Herbaria (CNALH 2018), nearly half (4,136, 42%) originated in the core Pine Barrens counties of Atlantic, Burlington, and Ocean, while 1,459 (15%) originated in the Kittatinny Mountains or Delaware Water Gap counties of Sussex and Warren. In contrast, Essex, Hudson, and Union counties, located across the Hudson River from New York City, are the least collected in the state (Figure 1). Although natural communities in these densely populated areas that include extensive urban and suburban areas may have been greatly impacted by human disturbance, recent studies in adjacent

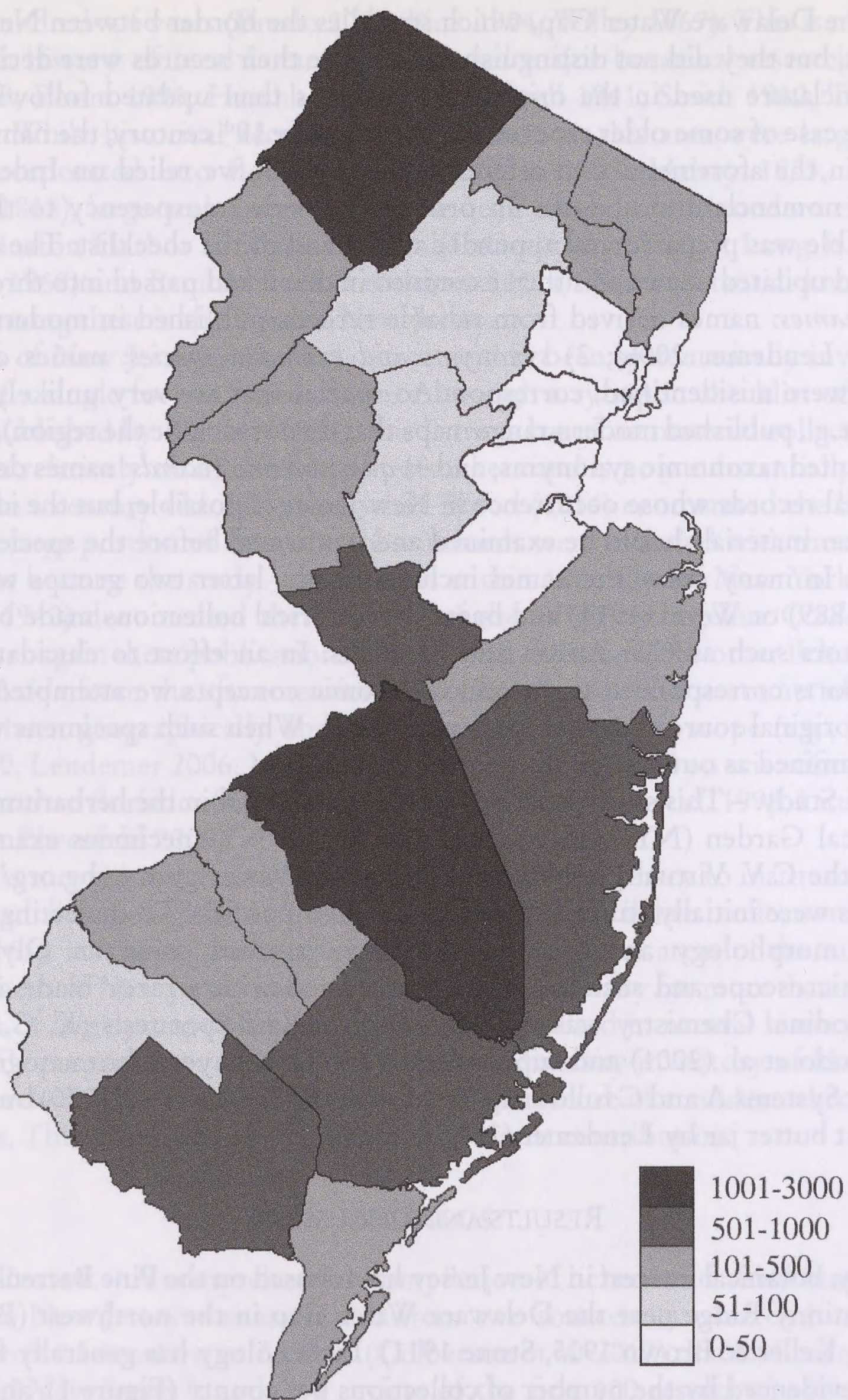


Figure 1. Number of lichen collections per county included in the Consortium of North American Lichen Herbaria (CNALH, accessed 9 Jan. 2018), supplemented by additional collections from the NYBG Virtual Herbarium (accessed 9 Jan. 2018) for Mercer County.

Staten Island in New York (Allen & Howe 2016) illustrate that lichens are almost certainly more frequent and diverse than the available data suggest.

Our survey of the literature combined with study of herbarium materials, led to the recognition of a total of 479 taxa of lichens, lichenicolous and allied fungi from New Jersey. The herbarium specimens examined for this study included the entire New Jersey holdings

at NY (4,931 specimens) and incorporated the results of extensive unpublished field studies carried out by ourselves in portions of central and southern New Jersey (Figure 2). The results of this survey are summarized in the form of a checklist in the proceeding section. Although beyond the scope of the present study, an important avenue for future research involves reexamination and verification of the historical collections from New Jersey made by I.M. Brodo (deposited at MSC), T.H. Nash (deposited at ASU) and J.W. Eckfeldt together with H.A. Green (deposited at PH).

Based on the composition of the total checklist, fully more than half of the biota of lichens and allied fungi in New Jersey corresponds to taxa with crustose growth forms (55%, 256 taxa), while the bulk of the remaining percentage correspond to foliose (27%, 128 taxa), fruticose (4%, 20 taxa) and squamulose (4%, 18 taxa) growth forms. An additional 10% (47 taxa) of the lichens were classified as having a polymorphic growth form because they have dimorphic thalli comprised of a primary growth form and a secondary form. Taxa with polymorphic growth forms are exemplified by many members of the genus *Cladonia* that have a squamulose primary thallus and a fruticose secondary thallus (Brodo et al. 2001), or *Baeomyces*, *Dibaeis* and *Pycnothelia* all of which have crustose primary thalli and fruticose secondary thalli (Brodo et al. 2001). Although growth forms are typically used to classify lichens into generalized groups of macro- and micro- lichens, certain crustose species with conspicuous and superficially foliose thalli are often included in the former group (e.g., Hinds & Hinds 2008). As such, we also examined the proportion of taxa that would be classified as macro- or microlichens and found that those groups corresponded well to the

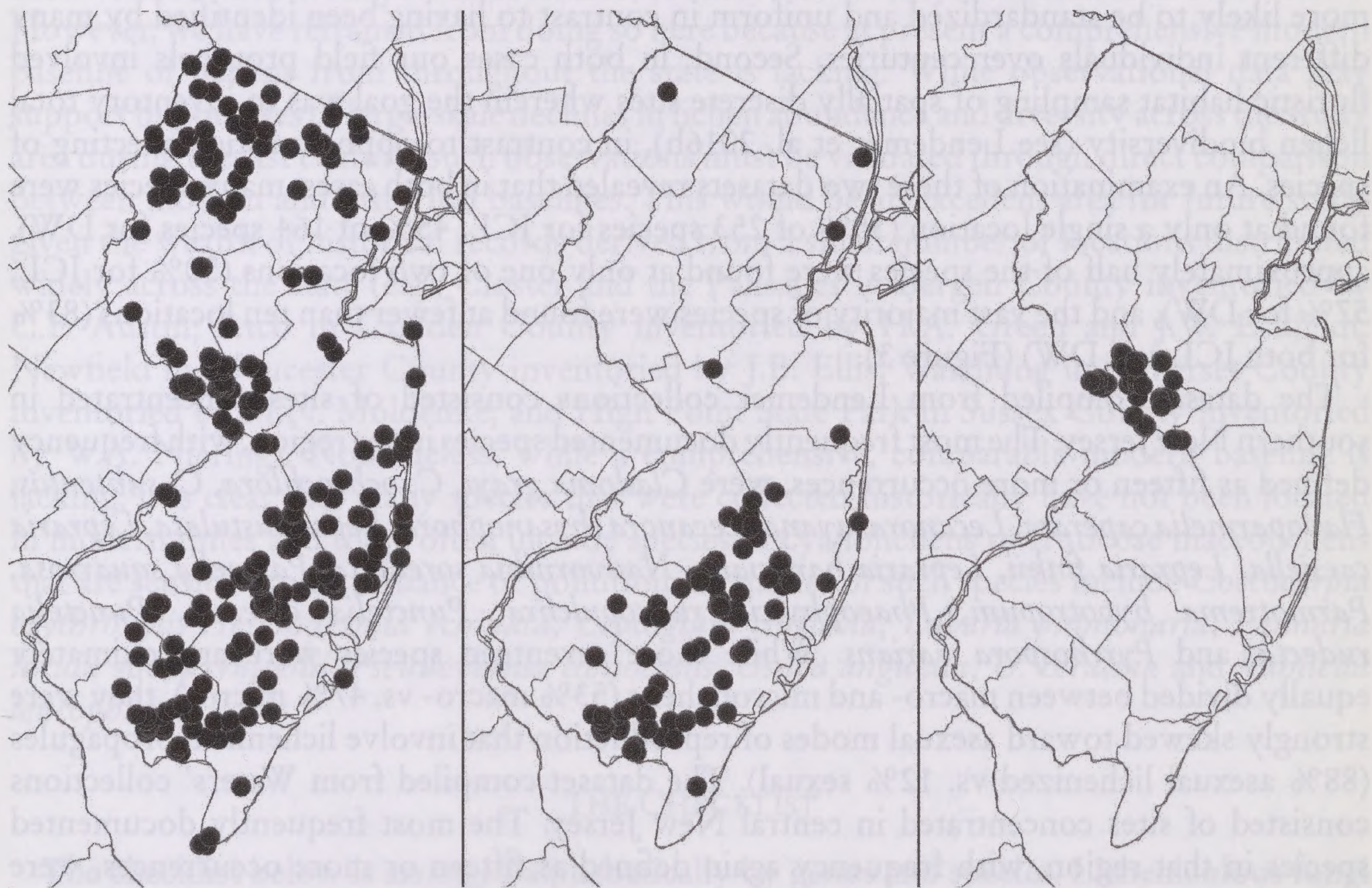


Figure 2. Maps illustrating the spatial distribution of the georeferenced specimens examined for this study. Left: all georeferenced specimens examined for this study (n=4,931). Center: specimens collected by JCL for this study (n=1,463). Right: Specimens collected by DW for this study (n=891).

proportion of species with crustose thalli to those with other growth forms (45% or 213 macrolichen taxa and 55% or 262 microlichen taxa).

Of the 475 taxa, 95% (451 taxa) were lichen-forming fungi, 3% (13 taxa) were lichenicolous fungi and 3% (11 taxa) were non-lichenized fungi often treated with lichens (e.g., *Mycocaliciaceae*). Meanwhile, of the lichenized taxa, the vast majority (83%, 371 taxa) are fungi that associate with green algal photobionts, while only 9% (41 taxa) associate with cyanobacteria and 7% (32 taxa) associate with the filamentous green algal genus *Trentepohlia*. Five additional taxa were classified as having a polymorphic nutrition mode because they primarily associate with green algae but also incorporate cyanobacteria into their thalli (i.e., members of *Lobaria* and *Stereocaulon*).

From the perspective of reproductive mode, more than half (64%, 302 taxa) of the biota reproduces primarily through the production of sexual ascospores, while just over a third (35%, 165 taxa) reproduce primarily through the production of asexual lichenized propagules such as soredia and isidia. Only a small number of species (6 taxa, 1% of the total) reproduce primarily using mitotic non-lichenized propagules (i.e., conidia) and these belong to two groups: lichenicolous fungi with named anamorphic states (e.g., Hawksworth 1981), and members of the lichen genus *Gyalideopsis* that nearly always produce hyphophores but variably produce apothecia (e.g., Lendemer 2017, Lücking et al. 2007).

In addition to the traits discussed above, we attempted to examine the frequency of lichen species in the study area. While we initially considered analyzing all available vouchers (e.g., the 9,836 in CNALH), we ultimately limited our study to two smaller datasets comprised of our own collections for two reasons. First, we had personally examined and verified the identifications of the vouchers, and as such, the nomenclature and taxonomy were more likely to be standardized and uniform in contrast to having been identified by many different individuals over centuries. Second, in both cases our field protocols involved floristic habitat sampling of spatially discrete sites wherein the goal was to inventory total lichen biodiversity (see Lendemer et al. 2016b), in contrast to opportunistic collecting of species. An examination of these two datasets revealed that in both cases, many species were found at only a single location (35% of 253 species for JCL, 45% of 164 species for DW), approximately half of the species were found at only one or two locations (50% for JCL, 57% for DW), and the vast majority of species were found at fewer than ten locations (83% for both JCL and DW) (Figure 3).

The dataset compiled from Lendemer collections consisted of sites concentrated in southern New Jersey. The most frequently documented species in the region, with frequency defined as fifteen or more occurrences, were *Cladonia grayi*, *C. ochrochlora*, *C. subtenuis*, *Flavoparmelia caperata*, *Lecanora layana*, *Lecanora thysanophora*, *Lepra pustulata*, *Lepraria caesiella*, *Lepraria finkii*, *Lepraria harrisiana*, *Nadvornikia sorediata*, *Parmelia squarrosa*, *Parmotrema hypotropum*, *Phaeophyscia rubropulchra*, *Punctelia caseana*, *Punctelia rudecta*, and *Pyrrhospora varians*. While those seventeen species were approximately equally divided between macro- and microlichens (53% macro- vs. 47% micro-), they were strongly skewed toward asexual modes of reproduction that involve lichenized propagules (88% asexual lichenized vs. 12% sexual). The dataset compiled from Waters' collections consisted of sites concentrated in central New Jersey. The most frequently documented species in that region, with frequency again defined as fifteen or more occurrences, were *Amandinea polyspora*, *Candelaria concolor*, *Cladonia ochrochlora*, *Flavoparmelia caperata*, *Lecanora strobilina*, *Lepraria finkii*, *Myelochroa aurulenta*, *Parmotrema hypotropum*,

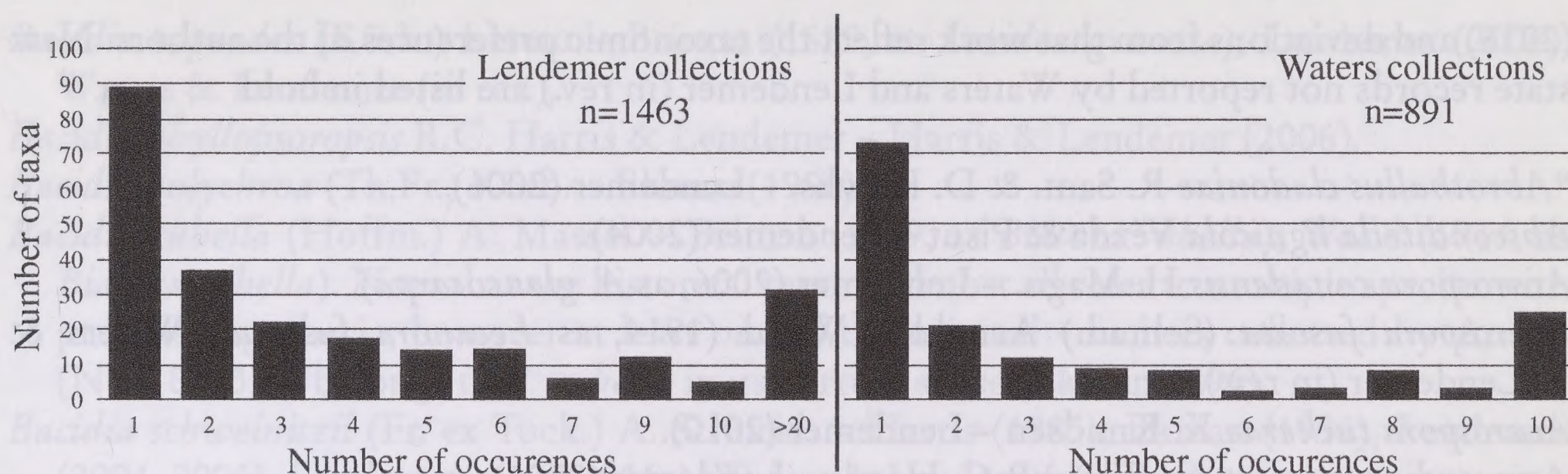


Figure 3. Species frequencies in two New Jersey lichen biodiversity datasets, expressed as the number of occurrences (unique locations where a species was collected) per taxon. Data compiled from herbarium material at NY collected by JCL (n=1463) and DW (n=891).

Physcia millegrana, *Pyrrhospora varians*, *Pyxine subcinerea* and *Ropalospora viridis*. As was the case for southern New Jersey lichens, those twelve species were approximately equally divided between macro- and microlichens (58% macro- vs. 42% micro-) as well as strongly skewed toward asexual reproduction via lichenized propagules (75% asexual lichenized vs. 25% sexual). Importantly, both sets of the most frequent species are comprised of taxa documented to be common and have broad geographic distributions in temperate eastern North America (e.g., Brodo et al. 2001; Hinds & Hinds 2007; Lendemer 2011, 2013).

It is tempting to contrast the above results with a comparison of the rarest species, be it those encountered during our field studies, or those known only from historical occurrences. However, we have refrained from doing so here because at present a comprehensive modern baseline of lichens from throughout the state is lacking. While observational data may support hypotheses of large-scale declines in lichen abundance and diversity across the study area during the last century, such observations must be validated through direct comparison between modern and historical baselines. This would be an excellent area for future study given the wealth of historical records derived from a small number of locations distributed widely across the state (e.g., Closter and the Palisades in Bergen County inventoried by C.F. Austin; Atco in Camden County inventoried by H.A. Green and J.W. Eckfeldt; Newfield in Gloucester County inventoried by J.B. Ellis; Watchung in Somerset County inventoried by M.N. Moldenke; and High Point State Park in Sussex County inventoried by W.A. Niering). Nonetheless, while a comprehensive, comparable modern baseline is lacking, it is clear that many species that were collected historically have not been located in modern times and these often include species of cyanolichens or fruticose macrolichens that are sensitive to disturbance or pollution. Examples of such species include *Coccocarpia erythroxyli*, *Heterodermia echinata*, *Leptogium corticola*, *Lobaria pulmonaria*, *Pannaria lurida* subsp. *russellii*, *Pseudevernia consocians*, *Usnea angulata*, *U. ceratina* and *Vahliella leucophaea*.

THE CHECKLIST

The checklist below is arranged alphabetically by genus and species. Lichenicolous fungi are denoted with an asterisk (*) and non-lichenized species with a plus sign (+). Original literature reports are cited following each name. Nomenclature generally follows Esslinger

(2016) and deviations from that work reflect the taxonomic preferences of the authors. New state records not reported by Waters and Lendemer (in rev.) are listed in **bold**.

- **Abrothallus cladoniae* R. Sant. & D. Hawks. – Lendemer (2006).
Absconditella lignicola Vězda & Pisut – Lendemer (2004).
Acarospora canadensis H. Magn. – Lendemer (2006, as *A. glaucocarpa*).
Acarospora fuscata (Schrad.) Arnold – Wood (1914, as *Lecanora fuscata*), Waters & Lendemer (in rev.).
Acarospora tuckerae K. Knudsen – Lendemer (2010).
Acrocordia megalospora (Fink) R.C. Harris – Lendemer (2006).
Agonimia opuntiella (Buschardt & Poelt) Vězda – Lendemer (2006).
Ahtiana aurescens (Tuck.) A. Thell & Randlane – Britton (1889, as *Cetraria aurescens*), Wood (1914, as *Platysma aurescens*).
Alyxoria varia (Pers.) Ertz & Tehler – Britton (1889, as *Opegrapha varia*).
Amandinea milliaria (Tuck.) P. May & Sheard – Britton (1889, as *Rinodina milliaria*), Lendemer (2004), Waters & Lendemer (in rev.).
Amandinea polyspora (Willey) E. Lay & P. May – Harris (1985, as *Buellia polyspora*), Lendemer (2004, 2006), Struwe et al. (2014), Waters & Lendemer (in rev.).
Amandinea punctata (Hoffm.) Coppins & Scheid. – Britton (1889, as *Buellia myriocarpa*), Thomson (1935, as *B. myriocarpa*), Lendemer (2004).
Anaptychia palmulata (Michx.) Vain. – Britton (1889, as *Physcia aquila* var. *detonsa*), Wood (1914, as *Pseudophyscia aquila detonsa*), Torrey (1933, as *Physcia aquila detonsa*), Hastings (1940, as *A. aquila*), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
Anisomeridium carinthiacum (J. Steiner) R.C. Harris – Waters & Lendemer (in rev.).
Anisomeridium leucochlorum (Müll. Arg.) R.C. Harris – Lendemer (2004), Waters & Lendemer (in rev.).
Anisomeridium polypori (Ellis & Everh.) M.E. Barr – Harris (1985, as *A. nyssaegenum*), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
Anzia colpodes (Ach.) Stizenb. – Britton (1889, as *Parmelia colpodes*), Wood (1914), Lendemer (2006).
Arthonia apatetica (A.Massal.) Th.Fr. – Waters & Lendemer (in rev.).
**Arthonia digitatae* Hafellner – Knudsen & Lendemer (2007).
**Arthonia epiphyscia* Nyl. – Lendemer (2008).
Arthonia helvola (Nyl.) Nyl. – **Specimen examined: Sussex Co., Stokes State Forest, Sunrise Mountain summit, 29 Mar. 2008, on Quercus, J.C. Lendemer et al. 11572 (NY).**
Arthonia impallens Nyl. – Nylander (1885).
Arthonia pyrrhuliza Nyl. – **Specimen examined: Without locality, C.F. Austin 619 (NY).**
Arthonia quintaria Nyl. – Nylander (1885).
Arthonia ruana A. Massal. – **Specimen examined: Passaic Co., Little Falls, 15 Aug. 1895, A. Schneider s.n. (NY).**
Arthonia susa R.C. Harris & Lendemer – Lendemer et al. (2013).
Arthothelium spectabile (Flot.) A. Massal. – Britton (1889, as *Arthonia spectabilis*).
Aspicilia caesiocinerea (Malbr.) Arnold – Waters & Lendemer (in rev.).
Aspicilia cinerea (L.) Körb. – Britton (1889, as *Lecanora cinerea*), Moldenke (1934a, 1935, as *L. cinerea*), Waters & Lendemer (in rev.).
Aspicilia laevata (Ach.) Arnold – Waters & Lendemer (in rev.).

- Bacidia coprodes* (Körb.) Lettau – Britton (1889, as *Lecidea granosa*), Lendemer (2006), Waters & Lendemer (in rev.).
- Bacidia phyllopsoropsis* R.C. Harris & Lendemer – Harris & Lendemer (2006).
- Bacidia polychroa* (Th.Fr.) Körb. – Ekman (1996).
- Bacidia rubella* (Hoffm.) A. Massal. – Britton (1889, as *Biatora rubella*), Wood (1914, as *Biatora rubella*). Note that the historical reports almost all refer to multiple species with pruinose apothecia, however at least one of the original vouchers collected by Austin (NY-1079339) belongs to *B. rubella* in its current sense (Ekman 1996).
- Bacidia schweinitzii* (Fr. ex Tuck.) A. Schneid. – Harris (1985), Ekman (1996), Lendemer (2004, 2006), Lendemer et al. (2016a), Waters & Lendemer (in rev.).
- Bacidia solediata* Lendemer & R.C. Harris – Lendemer et al. (2016a), Waters & Lendemer (in rev.).
- Bacidia suffusa* (Fr.) A. Schneid. – Britton (1889), Ekman (1996).
- Bacidina delicata* (Leight.) V. Wirth & Vězda – *Specimens examined*: Burlington Co., Wharton State Forest, Sweetwater, 18 Apr. 2005, on *Quercus*, J.C. Lendemer 3904 (NY). Salem Co., Parvin State Park, vicinity of Muddy Run, 26 Dec. 2008, on old wood plank, J.C. Lendemer et al. 15031 (NY).
- Bacidina egenula* (Nyl.) Vězda – Lendemer (2004, 2006).
- Baeomyces rufus* (Hudson) Rebent. – Britton (1889, as *B. byssoides*).
- Biatora longispora* (Degel.) Lendemer & Printzen – Printzen & Tønsberg (2004), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Biatora pontica* Printzen & Tønsberg – Waters & Lendemer (in rev.).
- Biatora printzenii* Tønsberg – Lendemer (2006), Waters & Lendemer (in rev.).
- Biatora pycnidiata* Printzen & Tønsberg – Printzen & Tønsberg (2004), Harris & Lendemer (2006).
- Biatora vernalis* (L.) Fr. – Britton (1889), Moldenke (1935, as *Lecidea vernalis*).
- Biatorella hemisphaerica* Anzi – Britton (1889, as *Biatora fossarum*).
- Bilimbia sabuletorum* (Schreb.) Arnold – Britton (1889, as *Biatora hypnophila*).
- Botryolepraria lesdainii* (Hue) Canals et al. – Lendemer (2008).
- Brigantiaea leucoxantha* (Spreng.) R.Sant. & Hafellner – *Specimen examined*: Cape May Co., Cape May Point, 1935, R.H. Torrey s.n. (NY).
- Bryoria furcellata* (Fr.) Brodo & D. Hawksw. – Britton (1889, as *Alectoria jubata*, *A. jubata* var. *chalybeiformis*).
- Bryoria trichodes* (Michx.) Brodo & D. Hawksw. subsp. *trichodes* – Britton (1889, as *Alectoria jubata* var. *implexa*).
- Buellia curtisii* (Tuck.) Imshaug – Harris (1985), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Buellia dialyta* (Nyl.) Tuck. – Britton (1889).
- Buellia spuria* (Schaer.) Anzi – Britton (1889).
- Buellia stillingiana* J. Steiner – Harris (1985), Lendemer (2006), Waters & Lendemer (in rev.).
- Buellia vernicoma* (Tuck.) Tuck. – Britton (1889), Harris (1985), Lendemer (2004).
- Calicium abietinum* Pers. – Britton (1889, as *C. curtum*), Lendemer (2004).
- Calicium adpersum* Pers. – Britton (1889, as *C. rosoidum*), Wood (1914, as *C. rosoidum*).
- Calicium lenticulare* Ach. – Harris (1985, as *C. subquercinum*).
- Caloplaca camptidia* (Tuck.) Zahlbr. – Britton (1889, as *Placodium camptidium*), Harris (1985).

- Caloplaca cerina* (Hedw.) Th. Fr. – Britton (1889, as *Placodium cerinum*).
- Caloplaca feracissima* H. Magn. – Lendemer (2004, 2006).
- Caloplaca flavocitrina* (Nyl.) H.Olivier – Lendemer (2004, 2006; as *C. citrina*), Waters & Lendemer (in rev.).
- Caloplaca flavovirescens* (Wulfen) Dalla Torre & Sarnth. – Moldenke (1935), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Caloplaca microphyllina* (Tuck.) Hasse – Britton (1889, as *Placodium microphyllum*).
- Caloplaca sideritis* (Tuck.) Zahlbr. – Moldenke (1935), Waters & Lendemer (in rev.).
- Caloplaca subsoluta* (Nyl.) Zahlbr. – Wetmore (2003), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Candelaria concolor* (Dicks.) Stein – Britton (1889, as *Teloschistes concolor*), Wood (1914), Torrey (1933), Moldenke (1935), Lendemer (2004, 2006), Struwe et al. (2014), Waters & Lendemer (in rev.).
- Candelariella aurella* (Hoffm.) Zahlbr. – *Specimens examined*: Burlington Co., Lebanon State Forest, int. of Savoy Blvd. & NJ72, 9 Sept. 2006, on concrete, *J.C. Lendemer et al.* 7550 (NY). Cumberland Co., Bivalve, 26 May 2007, on old logs, *J.C. Lendemer* 9089 & *A. Moroz* (NY). Monmouth Co., Allaire State Park, S corner between Squankum Rd. & Hospital Rd., 5 Feb. 2009, on concrete, *J.C. Lendemer* 15429A (NY); Sandy Hook National Recreation Area, 6 May 1984, on cement, *R.C. Harris* 18013 (NY).
- Candelariella efflorescens* Buck & R.C. Harris – Harris (1985), Lendemer (2006), Waters & Lendemer (in rev.).
- Candelariella vitellina* (Hoffm.) Müll. Arg. – Britton (1889, as *Placodium vittellinum*), Torrey (1933), Moldenke (1934a, 1935).
- Candelariella xanthostigma* (Ach.) Lettau – Harris (1985).
- Candelariella xanthostigmoides* (Müll. Arg.) R.W. Rogers – Lendemer (2004, 2006 as *C. reflexa*), Waters & Lendemer (in rev.).
- Canoparmelia caroliniana* (Nyl.) Elix & Hale – Cumberland Co., Bear Swamp West, 0.2 mi E of N-S trail at point ~0.4 mi SE of Ackley Rd./CR718, 17 Feb. 2012, on *Magnolia*, *B.P. Hodkinson et al.* 18035 (NY).
- Carbonicola anthracophila* (Nyl.) Bendiksby & Timdal – Britton (1889, as *Biatora anthracophila*), Lendemer (2004, 2006, as *Hypocenomyce anthracophila*).
- Catillaria nigroclavata* (Nyl.) Schuler – Waters & Lendemer (in rev.).
- Catinaria atropurpurea* (Schrad.) Poelt & Vězda – Lendemer (2004, 2006).
- Catinaria neuschildii* (Körb.) P. James – Waters & Lendemer (in rev.).
- Cetraria arenaria* Kärnefelt – *Specimens examined*: Burlington Co., Warren Grove Target Area, N of Warren Grove Rd., 5 Sept. 2004, on sand, *J.C. Lendemer et al.* 2902 (NY); Brendan Byrne State Forest, S of Norelmon Rd. 0.2 mi SW of jct w/ Coopers Rd., 7 Jul. 2015, on sand, *J.C. Lendemer et al.* 45875 (NY); Wharton State Forest, Quaker Bridge, 10 Sept. 1986, *M. Peidl* 5104 (NY). Sussex Co., High Point State Park, 12 Sept. 1992, *W.R. Buck* 21548 (NY); Flatbrookville, 1937, *G.G. Nearing s.n.* (NY). Warren Co., Delaware Water Gap, Oct. 1867, *C.F. Austin* 445 (NY).
- Cetrelia chicitae* (W.L. Culb.) W.L. Culb. & C.F. Culb. – *Specimens examined*: Passaic Co., Ringwood, back of the Cannon Mine, Nov. 1935, *G.P. Anderson s.n.* (NY); Terrace Pond, 1947, collector unknown (NY). Sussex Co., Wawayanda, Nov. 1931, *G.P. Anderson s.n.* (NY).
- Cetrelia olivetorum* (Nyl.) W.L. Culb. & C.F. Culb. – *Specimens examined*: Without specific locality, *C.F. Austin* 240 (NY). Bergen Co., Palisades, 1869, *C.F. Austin s.n.*

- (NY). Passaic Co., Little Falls, *C.F. Austin s.n.* (NY). Sussex Co., Wawayanda, Nov. 1936, *G.P. Anderson s.n.* (NY).
- Chaenotheca hygrophila* Tibell – Lendemer (2006).
- Chaenotheca phaeocephala* (Turner) Th. Fr. – Britton (1889, as *Calicium phaeocephalum*).
- Chaenotheca xyloxena* Nádv. – Harris (1985).
- Chaenothecopsis debilis* (Turner & Borrer ex Sm.) Tibell – Waters & Lendemer (in rev.).
- Chaenothecopsis savonica* (Räsänen) Tibell – Lendemer (2004, 2006).
- Chrysothrix caesia* (Flot.) Ertz & Tehler – Britton (1889, as *Arthonia lecideella*), Lendemer (2004, as *Arthonia caesia*), Waters & Lendemer (in rev.).
- Chrysothrix chamaecyparicola* Lendemer – Lendemer (2006, as *C. flavovirens*), Lendemer & Elix (2010).
- Cladonia apodocarpa* Robbins – Evans (1935, 1938, 1940), Moldenke (1935), Forman (1998), Olsson (1998), Lendemer & Hodkinson (2009).
- Cladonia arbuscula* (Wallr.) Flot. – Lendemer (2004, 2006).
- Cladonia atlantica* A. Evans – Bard (1952), Harris (1985), Forman (1998), Olsson (1998), Lendemer (2004, 2006, 2009), Howe (2016).
- Cladonia beaumontii* (Tuck.) Vain. – Lendemer (2006).
- Cladonia boryi* Tuck. – Evans (1935, 1938).
- Cladonia brevis* (Sandst.) Sandst. – Evans (1938), Lendemer (2006).
- Cladonia caespiticia* (Pers.) Flörke – Britton (1889), Torrey (1933a), Evans (1935, 1938, 1940), Hastings (1940), Moldenke (1940), Harris (1985), Lendemer (2004, 2006), Lendemer & Hodkinson (2009), Waters & Lendemer (in rev.).
- Cladonia cariosa* (Ach.) Spreng. – Britton (1889).
- Cladonia chlorophaea* (Flörke) Spreng. – Torrey (1933), Moldenke (1934a, 1935), Evans (1935, 1938, 1940), Thomson (1935), Hastings (1940), Little (1951), Bard (1952), Forman (1998), Struwe et al. (2014), Howe (2016), Waters & Lendemer (in rev.).
- Cladonia coniocraea* (Flörke) Spreng. – This species was reported by Lendemer (2004, 2006), however all of the specimens originally assigned to it from New Jersey have been referred to *C. ochrochlora* with the exception of *Lendemer 3208* (NY) from Burlington County. As has been summarized by Fontaine et al. (2010), the delimitation of *C. coniocraea* and *C. ochrochlora* requires further study. Nonetheless we retain *C. coniocraea* for specimens with diminutive squamules and slender podetia that lack a basal cortical collar.
- Cladonia conista* (Nyl.) Robbins – Moldenke (1935, 1940), Evans (1938, 1940), Lendemer (2006).
- Cladonia cristatella* Tuck. – Britton (1889), Torrey (1933), Moldenke (1934, 1935, 1940), Evans (1935, 1938, 1940), Thomson (1935), Rapp & Rapp (1946), Little (1951), Bard (1952), Harris (1985), Forman (1998), Olsson (1998), Kiviat & MacDonald (2002), Lendemer (2004, 2006), Struwe et al. (2014), Howe (2016), Waters & Lendemer (in rev.).
- Cladonia cryptochlorophaea* Asah. – Lendemer (2006), Howe (2016), Waters & Lendemer (in rev.).
- Cladonia cylindrica* (A. Evans) A. Evans – Evans (1935, 1938, 1940, as *C. borbonica*), Moldenke (1935, as *C. borbonica*), Lendemer (2006), Waters & Lendemer (in rev.).
- Cladonia didyma* (Fée) Vain. – Evans (1935, 1938), Evans (1940, as *C. vulcanica*), Moldenke (1940, as *C. vulcanica*), Little (1951), Lendemer (2006), Howe (2016), Waters & Lendemer (in rev.).
- Cladonia dimorphoclada* Robbins – Evans (1938, as *C. caroliniana* f. *dimorphoclada*), Harris (1985), Lendemer (2004, 2006), Howe (2016), Waters & Lendemer (in rev.).

- Cladonia floerkeana* (Fr.) Flörke – Evans (1935, 1940), Lendemer (2004, 2006), Howe (2016).
- Cladonia floridana* Vain. – Evans (1935, 1938, 1940), Torrey (1936), Forman (1998), Olsson (1998), Lendemer (2004, 2006).
- Cladonia furcata* (Huds.) Schrad. – Britton (1889), Wood (1914), Torrey (1933), Evans (1935, 1938, 1940), Moldenke (1935, 1940), Thomson (1935), Hastings (1940), Waters & Lendemer (in rev.).
- Cladonia grayi* G. Merr. ex Sandst. – Evans (1935, 1938, 1940), Moldenke (1938, 1939, 1940), Rapp & Rapp (1946), Harris (1985), Forman (1998), Olsson (1998), Lendemer (2004, 2006), Howe (2016), Waters & Lendemer (in rev.).
- Cladonia incrassata* Flörke – Torrey (1933, 1933a), Evans (1935, 1938, 1940), Moldenke (1940), Little (1951), Culberson et al. (1982), Harris (1985), Forman (1998), Olsson (1998), Lendemer (2004, 2006), Howe (2016), Waters & Lendemer (in rev.).
- Cladonia leporina* Fr. – Britton (1889), Torrey (1936), Evans (1938).
- Cladonia macilenta* Hoffm. – Britton (1889), Wood (1914), Evans (1935, 1938, 1940), Hastings (1940), Bard (1952), Lendemer (2004, 2006), Howe (2016), Waters & Lendemer (in rev.).
- Cladonia macilenta* var. *bacillaris* (Ach.) Schaer. – Evans (1935, 1938, 1940, as *C. bacillaris*), Thomson (1935, as *C. bacillaris*), Moldenke (1935, as *C. bacillaris*), Little (1951, as *C. bacillaris*), Harris (1985, as *C. bacillaris*), Forman (1998, as *C. bacillaris*), Waters & Lendemer (in rev.).
- Cladonia mateocyatha* Robbins – Evans (1938, 1940), Bard (1952).
- Cladonia ochrochlora* Flörke – Torrey (1933, as *C. coniocraea*), Evans (1935, 1940), Evans (1935, 1938, 1940, as *C. coniocraea*), Moldenke (1935, 1940, as *C. coniocraea*), Little (1951, as *C. coniocraea*), Bard (1952, as *C. coniocraea*), Harris (1985), Forman (1998, as *C. coniocraea*), Olsson (1998, as *C. coniocraea*), Lendemer (2004, 2006), Lendemer (2004, 2006, as *C. coniocraea*), Struwe et al. (2014, as *C. coniocraea*), Waters & Lendemer (in rev.).
- Cladonia parasitica* (Hoffm.) Hoffm. – Britton (1889, as *C. delicata*), Evans (1935, 1938, 1940, as *C. delicata*), Hastings (1940, as *C. delicata*), Moldenke (1940, as *C. delicata*), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Cladonia petrophila* R.C. Harris – Lendemer & Hodgkinson (2009), Waters & Lendemer (in rev.).
- Cladonia peziziformis* (With.) J.R. Laundon – Britton (1889, as *C. mitrula*), Wood (1914, as *C. mitrula*), Torrey (1933, as *C. mitrula*), Moldenke (1934a, 1935, as *C. mitrula*), Evans (1935, 1938, 1940, as *C. mitrula*), Hastings (1940, as *C. mitrula*), Bard (1952, as *C. capitata*), Lendemer (2006), Waters & Lendemer (in rev.).
- Cladonia piedmontensis* G. Merr. – Evans (1935, 1940), Moldenke (1940), Nearing (1940a).
- Cladonia pleurota* (Flörke) Schaer. – Evans (1935, 1938, 1940), Moldenke (1935), Little (1951), Harris (1985), Lendemer (2004), Lendemer (2006, as *C. diversa*), Waters & Lendemer (in rev.).
- Cladonia polycarpoides* Nyl. – Kiviat & MacDonald (2002), Lendemer (2004), Waters & Lendemer (in rev.).
- Cladonia pyxidata* (L.) Hoffm. – Britton (1889), Evans (1935, 1938, 1940), Dix (1942), Rosentreter & Belnap (2001).
- Cladonia ramulosa* (With.) J.R. Laundon – Evans (1935, 1940, as *C. pityrea*), Moldenke (1940, as *C. pityrea*), Lendemer (2004, 2006), Waters & Lendemer (in rev.).

- Cladonia rangiferina* (L.) F. H. Wigg. – Britton (1889), Evans (1935, 1938, 1940), Thomson (1935), Torrey (1937), Niering (1953), Moul & Buell (1955), Glenn et al. (1991), Lendemer (2006), Howe (2016).
- Cladonia rappii* A. Evans – Evans (1935, 1938, 1940, as *C. calycantha*), Little (1951, as *C. calycantha*), Forman (1998, as *C. calycantha*), Lendemer (2004, 2006), Howe (2016), Waters & Lendemer (in rev.).
- Cladonia ravenelii* Tuck. – Evans (1935, 1940), Lendemer (2006).
- Cladonia rei* Schaer. – Evans (1935, 1938, 1940, as *C. nemoxyna*), Culberson et al. (1985), Lendemer (2006), Waters & Lendemer (in rev.).
- Cladonia santensis* Tuck. – Evans (1935, 1938, 1940), Torrey (1936), Little (1951), Harris (1985), Forman (1998), Olsson (1998), Lendemer (2006).
- Cladonia sobolescens* Nyl. – Harris (1985), Lendemer (2006).
- Cladonia squamosa* (Scop.) Hoffm. – Britton (1889), Moldenke (1934a, 1935, 1939, 1940), Evans (1935, 1938, 1940), Hastings (1940), Dix (1942), Little (1951), Harris (1985), Forman (1998), Olsson (1998).
- Cladonia strepsilis* (Ach.) Grognot – Evans (1935, 1938, 1940), Moldenke (1939), Harris (1985), Olsson (1998), Lendemer (2006).
- Cladonia submitis* A. Evans – Forman (1998), Lendemer (2004, 2006), Howe (2016).
- Cladonia subtenuis* (Abbayes) Mattick – Harris (1985), Forman (1998), Olsson (1998), Sedia & Ehrenfeld (2003, 2005, 2006), Lendemer (2004, 2006), Howe (2016), Waters & Lendemer (in rev.).
- Cladonia uncialis* (L.) F.H. Wigg. – Britton (1889), Wood (1914), Evans (1935, 1938, 1940), Moldenke (1935), Torrey (1937), Niering (1953), Moul & Buell (1955), Harris (1985), Forman (1998), Rosentreter & Belnap (2001), Sedia & Ehrenfeld (2003, 2005, 2006), Lendemer (2004, 2006), Howe (2016).
- Cladonia verticillata* (Hoffm.) Schaer. – Britton (1889, as *C. gracilis* “var. verticillata”), Evans (1935, 1938, 1940), Thomson (1935), Moldenke (1940), Hastings (1940), Harris (1985).
- **Clypeococcum hypocenomycis* D. Hawks. – Lendemer (2006).
- Coccocarpia erythroxyli* (Spreng.) Swinscow & Krog – *Specimen examined*: Gloucester Co., Newfield, without date, *J.B. Ellis 106* (NY).
- Coccocarpia palmicola* (Spreng.) Arv. & D.J. Galloway – Britton (1889, as *Pannaria molybdaea* var. *cronia*).
- Coenogonium pineti* (Ach.) Lücking & Lumbsch – Britton (1889, as *Gyalecta pineti*), Lendemer (2006), Waters & Lendemer (in rev.).
- Collema flaccidum* (Ach.) Ach. – Britton (1889), Moldenke (1935, as *C. rupestre*), Waters & Lendemer (in rev.).
- Collema leptaleum* Tuck. – Britton (1889).
- Collema nigrescens* (Huds.) DC. – Britton (1889).
- Collema pustulatum* Ach. – *Specimen examined*: Warren Co., Delaware Water Gap, 1867, *C.F. Austin 451* (NY).
- Collema ryssoleum* Tuck. – Britton (1889), Wood (1914).
- Collema subflaccidum* Degel. – Lendemer (2006).
- Collemopsidium halodytes* (Nyl.) Grube & B.D. Ryan – Taylor (1982, as *Arthopyrenia halodytes*).
- **Cornutispora ciliata* Kalb – *Specimen examined*: Burlington Co., Wharton State Forest, margins of Hampton Rd. ~2 mi NE of Atsion, 4 Jan. 2004, on *Cladonia pleurota* on sandy soil, *J.C. Lendemer 1759 & M.J. Moody* (NY).

Crespoa crozalsiana (B.de Lesd. ex Harm.) Lendemer & Hodkinson – Waters & Lendemer (in rev.).

Crocodia aurata (Ach.) Link – Britton (1889, as *Sticta aurata*), Wood (1914, as *S. aurata*).

Cyphelium tigillare (Ach.) Ach. – Britton (1889, as *Acolium tigillare*).

Dermatocarpon arenosaxi Amtoft – Amtoft et al. (2008).

Dermatocarpon luridum (With.) J. R. Laundon – Amtoft et al. (2008), Waters & Lendemer (in rev.).

Dermatocarpon muhlenbergii (Ach.) Müll. Arg. – *Specimen examined*: Sussex Co., Springdale, 25 Jul. 1948, collector unknown (NY).

Dibaeis baeomyces (L.) Rambold & Hertel – Britton (1889, as *Baeomyces roseus*), Moldenke (1934, as *B. roseus*), Hastings (1940, as *B. roseus*), Lendemer (2004).

Dimelaena oreina (Ach.) Norman – Hastings (1940, as *Rinodina oreina*), Niering (1953, as *R. oreina*).

Diploschistes muscorum (Scop.) R. Sant. – Lendemer (2004, 2006), Waters & Lendemer (in rev.).

Diploschistes scruposus (Schreb.) Norman – Britton (1889, as *Urceolaria scruposa*).

Enchylium conglomeratum (Hoffm.) Otálora, P.M. Jørg. & Wedin – Britton (1889, as *Collema cyrtaspis* and *C. pycnocarpum*), Wood (1914, as *C. pycnocarpum*).

Enchylium tenax (Sw.) Gray – Britton (1889, as *Collema tenax*).

Endocarpon pallidulum (Nyl.) Nyl. – Lendemer (2007).

Endocarpon petrolepideum (Nyl.) Nyl. – Lendemer (2004, as *E. pusillum*; 2007).

**Endococcus propinquus* (Körb.) D. Hawksw. – Waters & Lendemer (in rev.).

Ephebe hispidula (Ach.) Horw. – *Specimens examined*: Bergen Co., Closter, without date, C.F. Austin s.n. (NY), Jun. 1869, C.F. Austin 7 (NY); Palisades, C.F. Austin s.n. (NY). Camden Co., without specific location, 20 Jan. 1874, C.F. Austin s.n. (NY).

Evernia prunastri (L.) Ach. – Waters & Lendemer (in rev.).

Fellhanera fallax R.C. Harris & Lendemer – Harris & Lendemer (2009), Waters & Lendemer (in rev.).

Fellhanera minnisinkorum R.C. Harris & Lendemer – Harris & Lendemer (2009).

Fellhanera silicis R.C. Harris & Ladd – Waters & Lendemer (in rev.).

Fissurina insidiosa C. Knight & Mitten – *Specimen examined*: Cumberland Co., Bear Swamp West, ~2 mi NE of Newport, 26 Apr. 2003, on *Magnolia*, J.C. Lendemer et al. 811 (NY).

Flavoparmelia baltimorensis (Gyeln. & Főriss) Hale – Waters & Lendemer (in rev.).

Flavoparmelia caperata (L.) Hale – Britton (1889, as *Parmelia caperata*), Wood (1914, as *P. caperata*), Moldenke (1934a, 1935, as *P. caperata*), Thomson (1935, as *P. caperata*), Hastings (1940, as *P. caperata*), Glenn et al. (1991, as *P. caperata*), Forman (1998, as *P. caperata*), Lendemer (2004, 2006), Orsi & Glenn (2009, as *P. caperata*), Struwe et al. (2014), Waters & Lendemer (in rev.).

Fuscidea arboricola Coppins & Tønsberg – Lendemer (2006).

Fuscidea arcuatula (Arnold) V. Wirth & Vězda – Lendemer (2008).

Fuscopannaria leucosticta (Tuck.) P. M. Jørg. – Britton (1889, as *Pannaria leucosticta*), Wood (1914, as *P. leucosticta*).

- Graphis scripta* (L.) Ach. – Britton (1889), Wood (1914), Thomson (1935), Hastings (1940), Lendemer (2004), Waters & Lendemer (in rev.).
- Gyalideopsis bartramiorum* Lendemer - Lücking et al. (2007, as *G. subaequatorianum*), Lendemer (2017).
- Gyalideopsis buckii* Lücking, Sérus. & Vězda – Waters & Lendemer (in rev.).
- Gyalideopsis moodyae* Lendemer & Lücking – Lendemer (2004), Lendemer & Lücking (2004), Lücking et al. (2007).
- Halecania pepegospora* (H. Magn.) Van den Boom – Waters & Lendemer (in rev.).
- Hertelidea pseudobotryosa* R.C. Harris Ladd & Printzen – Lendemer (2004, 2006).
- Heterodermia echinata* (Taylor) W.L. Culb. – *Specimen examined*: County unspecified, Pine Barrens, C.F. Austin s.n. (NY, likely source of the original report of *Physcia comosa* by Britton (1889)).
- Heterodermia granulifera* (Ach.) W.L. Culb. – Lendemer (2006).
- Heterodermia hypoleuca* (Muhl.) Trevis. – Britton (1889, as *Physcia hypoleuca*), Wood (1914, as *Pseudophyscia hypoleuca*), Torrey (1933, as *Physcia hypoleuca*), Harris (1985), Lendemer (2006).
- Heterodermia obscurata* (Nyl.) Trevis. – Harris (1985), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Heterodermia speciosa* (Wulfen) Trevis. – Britton (1889, as *Physcia speciosa*), Wood (1914, as *Pseudophyscia speciosa*), Torrey (1933, as *Physcia speciosa*), Moldenke (1935, as *Anaptychia speciosa*), Hastings (1940, as *A. speciosa*), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Hyperphyscia adglutinata* (Flörke) H. Mayrhofer & Poelt – Britton (1889, as *Physcia adglutinata*).
- Hypocenomyce scalaris* (Ach. ex Lilj.) M. Choisy – Lendemer (2004, 2006).
- Hypogymnia physodes* (L.) Nyl. – Britton (1889, as *Parmelia physodes*), Torrey (1933a, as *P. physodes*), Thomson (1935, as *P. physodes*), Hastings (1940, as *P. physodes*), Lendemer (2004, 2006).
- Hypotrachyna horrescens* (Taylor) Krog & Swinscow – Lendemer (2004, as *Parmelinopsis horrescens*), Lendemer (2006), Waters & Lendemer (in rev.).
- Hypotrachyna livida* (Taylor) Hale – Harris (1985), Lendemer (2004, 2006).
- Hypotrachyna minarum* (Vain.) Krog & Swinscow – Lendemer (2004, as *Parmelinopsis minarum*), Lendemer (2006), Waters & Lendemer (in rev.).
- Hypotrachyna osseoalba* (Vain.) Park & Hale – Lendemer (2004, 2006).
- Hypotrachyna showmanii* Hale – Lendemer (2006), Waters & Lendemer (in rev.).
- Icmadophila ericetorum* (L.) Zahlbr. – Britton (1889, as *Baeomyces aeruginosus*), Wood (1914, as *B. aeruginosus* and *I. ericetorum*).
- Imshaugia aleurites* (Ach.) S.F. Meyer – Britton (1889, as *Cetraria aleurites*), Moldenke (1935, as *Parmeliopsis aleurites*), Little (1951, as *C. aleurites*), Harris (1985, as *P. aleurites*), Lendemer (2004, 2006).
- Imshaugia placorodia* (Ach.) S.F. Meyer – Britton (1889, as *Cetraria aleurites* var. *placorodia*), Wood (1914, as *Parmeliopsis placorodia*), Little (1951, as *C. placorodia*), Lendemer (2004, 2006).
- Ionaspis alba* Lutzoni – Lutzoni (1994), Waters & Lendemer (in rev.).
- Ionaspis lacustris* (With.) Lutzoni – Britton (1889, as *Lecanora lacustris*), Moldenke (1934a, 1935, as *L. lacustris*).

- Japewiella dollypartoniana* J.L. Allen & Lendemer – Allen & Lendemer (2015).
 +*Julella fallaciosa* (Arn.) R.C. Harris – Lendemer (2006), Waters & Lendemer (in rev.).
- Lasallia papulosa* (Ach.) Llano – Britton (1889, as *Umbilicaria pustulata*), Wood (1914, as *U. pustulata*), Niering (1953).
Lasallia pensylvanica (Hoffm.) Llano – Britton (1889, as *Umbilicaria pennsylvanica*), Niering (1953).
Lathagrium fuscovirens (With.) Otálora, P.M. Jørg. & Wedin – Britton (1889, as *Collema furvum*).
Lecania croatica (Zahlbr.) Kotlov – Harris & Lendemer (2010), Waters & Lendemer (in rev.).
Lecania naegelii (Hepp) Diederich & van den Boom – *Specimen examined*: Bergen Co., Palisades, Apr. 1975, C.F. Austin 601 (NY).
Lecanora appalachensis Lendemer & R.C. Harris – Lendemer et al. (2013), Waters & Lendemer (in rev.).
Lecanora argentata (Ach.) Malme – Waters & Lendemer (in rev.).
Lecanora cupressi Tuck. – Britton (1889), Lendemer (2006).
Lecanora hybocarpa (Tuck.) Brodo – Harris (1985), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
Lecanora imshaugii Brodo – *Specimens examined*: Atlantic Co., along N bank of Tuckahoe River and below Aetna-Head of River Rd., 9 Sept. 2006, on *Quercus*, J.C. Lendemer et al. 7607 (NY). Bergen Co., Closter, C.F. Austin s.n. (NY), C.F. Austin 246 (NY), C.F. Austin 129 (NY). Cumberland Co., Peaslee Wildlife Management Area, ~1.5 mi N of jct NJ49 & CR671/Union Rd., 2 Feb. 2009, on *Quercus*, J.C. Lendemer 15056 (NY); Belleplain State Forest, ~2 mi W of jct NJ347 & CR550/Hoffman Mill Rd., 3 Feb. 2009, on *Carya*, J.C. Lendemer 15245 (NY).
Lecanora layana Lendemer – Lendemer (2015a), Waters & Lendemer (in rev.).
Lecanora minutella Nyl. – LaGreca & Lumbsch (2001), Lendemer (2004, 2006).
Lecanora nothocaesiella R.C. Harris & Lendemer – Lendemer et al. (2013), Waters & Lendemer (in rev.).
Lecanora oreinoides (Körber) Hertel & Rambold – Britton (1889, as *Lecidea tessellina*).
Lecanora rugosella Zahlbr. – Lendemer (2004).
Lecanora strobilina (Spreng.) Kieff. – Lendemer (2004, 2006), Struwe et al. (2014), Waters & Lendemer (in rev.).
Lecanora subpallens Zahlbr. – Harris (1985, as *L. caesiorubella* subsp. *prolifera*), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
Lecanora symmicta (Ach.) Ach. – Lendemer (2004).
Lecanora thysanophora R.C. Harris – Harris (1985), Harris et al. (2000), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
Lecanora willeyi Tuck. – Britton (1889).
Lecanora xylophila Hue – Lendemer (2008).
Lecidea cyrtidia Tuck. – Britton (1889), Moldenke (1934a, 1935), Waters & Lendemer (in rev.).
Lecidea erythrophaea Sommerf. – *Specimen examined*: Bergen Co., Closter, C.F. Austin 573 (NY).
Lecidea nylanderii (Anzi) Th. Fr. – Lendemer (2006).
Lecidea plebeja Nyl. – Lendemer (2004, 2006).

- Lecidea tessellata* Flörke – Britton (1889).
- Lecidella enteroleucella* (Nyl.) Hertel – Waters & Lendemer (in rev.).
- Leimonis erratica* (Körb.) R.C. Harris & Lendemer – Harris (1985, as *Lecidea erratica*), Lendemer (2004, 2006, as *Micarea erratica*), Waters & Lendemer (in rev.).
- Lempholemma polyanthes* (Schrad.) Malme – Britton (1889, as *Collema myriococcum*).
- Lepra amara* (Ach.) Hafellner – Lendemer (2004, 2006, as *Pertusaria amara*).
- Lepra multipunctoides* (Dibben) Lendemer & R.C. Harris – Harris (1985, as *Pertusaria multipunctoides*), Lendemer (2004, as *P. multipunctoides*).
- Lepra ophthalmiza* (Nyl.) Hafellner – Lendemer (2006, as *Pertusaria ophthalmiza*).
- Lepra pustulata* (Brodo & W.L. Culb.) Lendemer & R.C. Harris – Lendemer (2004, 2006, as *Loxospora pustulata*), Waters & Lendemer (in rev.).
- Lepraria caesiella* R.C. Harris – Lendemer (2006), Lendemer (2013), Waters & Lendemer (in rev.).
- Lepraria cryophila* Lendemer – Lendemer (2013).
- Lepraria elobata* Tønsberg – Lendemer (2006), Lendemer (2013).
- Lepraria finkii* (B. de Lesd.) R.C. Harris – Harris (1985), Lendemer (2004, as *Lepraria lobificans*), Lendemer (2006), Lendemer (2013), Waters & Lendemer (in rev.).
- Lepraria harrisiana* Lendemer – Lendemer (2013), Waters & Lendemer (in rev.).
- Lepraria hodkinsoniana* Lendemer – Lendemer (2004, as *L. incana*; 2006, as *L. aff. incana*), Lendemer (2013), Waters & Lendemer (in rev.).
- Lepraria neglecta* (Nyl.) Erichsen – Niering (1953, as *Crocynia neglecta*), Lendemer (2013), Waters & Lendemer (in rev.).
- Lepraria normandinoides* Lendemer & R.C. Harris race protocetraric acid chemotype – Lendemer (2013), Waters & Lendemer (in rev.).
- Lepraria oxybapha* Lendemer – Waters & Lendemer (in rev.).
- Lepraria vouauxii* (Hue) R.C. Harris – Waters & Lendemer (in rev.).
- Leprocaulon adhaerens* (K. Knudsen, Elix & Lendemer) Lendemer & Hodkinson – Waters & Lendemer (in rev.).
- Leptogium apalachense* (Tuck.) Nyl. – Sierk (1964).
- Leptogium azureum* (Sw.) Mont. – Sierk (1964).
- Leptogium byssinum* (Hoffm.) Nyl. – Britton (1889, as *Pannaria byssina*), Sierk (1964), Wood (1914, as *P. byssina*).
- Leptogium chloromelum* (Ach.) Nyl. – Britton (1889), Wood (1914).
- Leptogium corticola* Taylor – *Specimens examined*: Bergen Co., Closter, [C.F. Austin] 90 (NY); Closter, Palisades, C.F. Austin s.n. (NY). Camden Co., without locality, C.F. Austin 26 (NY), C.F. Austin s.n. (NY). Sussex Co., Andover, 5 Sept. 1938, G.P. Anderson s.n. (NY).
- Leptogium cyanescens* (Rabenh.) Körb. – Britton (1889, as *L. tremelloides*), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Leptogium dactylinum* Tuck. – Britton (1889), Wood (1914), Waters & Lendemer (in rev.).
- Leptogium millegranum* Sierk – Sierk (1964).
- +*Leptorhaphis epidermidis* (Ach.) Fr. – Waters & Lendemer (in rev.).
- Lichina confinis* (O.F. Müller) C. Agardh – Britton (1889).
- Lobaria pulmonaria* (L.) Hoffm. – Britton (1889, as *Sticta pulmonaria*), Wood (1914, as *S. pulmonaria*).
- Lobaria quercizans* Michx. – Britton (1889, as *Sticta quercizans*, as *S. amplissima*), Wood (1914, as *S. quercizans*, as *S. amplissima*), Lendemer (2004, 2006).

- Maronea polyphaea* H. Magn. – Britton (1889, as *Rinodina constans*). *Specimens examined*: County unknown, without locality, C.F. Austin 205 (NY), C.F. Austin Lich. Nov.-Caes. 113 (NY). Bergen Co., Closter, 9 Nov. 1864, C.F. Austin 217 (NY), without date, C.F. Austin s.n. (NY).
- Megalospora porphyritis* (Tuck.) R.C. Harris – *Specimen examined*: Ocean Co., Manahawkin Wildlife Management Area, 2 Dec. 2009, on *Quercus*, J.C. Lendemer 20072 (NY).
- Melanelia culbersonii* (Hale) A. Thell – *Specimens examined*: Sussex Co., Stokes State Forest, Sunrise Mountain, May 1940, J.W. Thomson s.n. (NY, original basis of report of *Parmelia stygia* by Thomson (1943)). Warren Co., Delaware Water Gap, Oct. 1867, C.F. Austin 436 (NY, original basis of report of *Cetraria fabluensis* by Britton (1889)).
- Melanelixia subaurifera* (Nyl.) Blanco et al. – Lendemer (2004, as *Melanelia subaurifera*), Lendemer (2006), Waters & Lendemer (in rev.).
- Menegazzia terebrata* (Hoffm.) A. Massal. – Britton (1889, as *Parmelia pertusa*), Wood (1914, as *P. pertusa*).
- Micarea chlorosticta* (Tuck.) R.C. Harris – Britton (1889, as *Biatora chlorosticta*), Little (1951, as *Bacidia chlorosticta*), Lendemer (2004).
- Micarea denigrata* (Fr.) Hedl. – Britton (1889, as *Biatora eynathea*/B. *denigrata*).
- Micarea globulosella* (Nyl.) Coppins – Lendemer (2006).
- Micarea melaena* (Nyl.) Hedl. – Lendemer (2004, 2006).
- Micarea micrococca* (Körb.) Gams ex Coppins – Barton & Lendemer (2014).
- Micarea neostipitata* Coppins & P. May – Coppins & May (2001).
- Micarea peliocarpa* (Anzi) Coppins & R. Sant. – Lendemer (2006).
- Micarea perparvula* (Nyl.) Coppins & Printzen – Coppins (2008).
- Micarea prasina* Fr. – Lendemer (2004, 2006), Barton & Lendemer (2014), Waters & Lendemer (in rev.).
- **Minutoexcipula mariana* V. Atienza – Lendemer (2004, as *Lichenodiplis mariana*).
- Multiclavula mucida* (Fr.) R.H. Petersen – *Specimen examined*: Atlantic Co., Tuckahoe Wildlife Management Area, gravel road 0.05 mi E of jct w/ Griscom Mill Rd., 2 Dec. 2009, on humus, J.C. Lendemer 20023A (NY).
- Multiclavula vernalis* (Schwein.) R.H. Petersen – Nelsen (2006).
- Mycobilimbia berengeriana* (A. Massal.) Hafellner & V. Wirth – Lendemer (2004, as *Lecidea berengeriana*), Waters & Lendemer (in rev.).
- Mycoblastus caesius* (Coppins & P. James) Tønsberg – *Specimen examined*: Burlington Co., Wharton State Forest, Batsto Natural Area, E of Atsion, ~0.5 mi N of Quaker Bridge, 23 Jun. 2003, on fallen branches, J.C. Lendemer 971 & L.H. Smith II (NY).
- +*Mycocalicium fuscipes* (Tuck.) Fink – Britton (1889, as *Calicium fuscipes*).
- +*Mycocalicium subtile* (Pers.) Szatala – Britton (1889, as *Calicium subtile*), Lendemer (2006).
- Mycoporum pycnocarpoides* Müll. Arg. – *Specimens examined*: Bergen Co., Closter, without date, C.F. Austin s.n. (NY, bound set #195), C.F. Austin 331 (NY). Gloucester Co., Newfield, Apr. 1885, J.B. Ellis s.n. (NY).
- Myelochroa aurulenta* (Tuck.) Elix & Hale – Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Myelochroa obsessa* (Ach.) Elix & Hale – Waters & Lendemer (in rev.).
- Myriolecis dispersa* (Pers.) Sliwa, Zhao Xin & Lumbsch – Lendemer (2004, 2006, as *Lecanora dispersa*), Waters & Lendemer (in rev.).
- Myriolecis hagenii* (Ach.) Sliwa, Zhao Xin & Lumbsch – Britton (1889, as *Lecanora hagenii*).

- Nadvornikia soorediata* R.C. Harris – Lendemer (2006), Waters & Lendemer (in rev.).
 +*Naetrocymbe punctiformis* (Pers.) R.C. Harris – Britton (1889, as *Pyrenula punctiformis*).
Nephroma helveticum Ach. – Britton (1889).
- Ochrolechia arborea* (Kreyer) Almb. – Lendemer (2004, 2006), Waters & Lendemer (in rev.).
Ochrolechia pseudopallescens Brodo – Harris (1985), Lendemer (2004, 2006).
Ochrolechia yasudae Vain. – Lendemer (2004).
Opegrapha atra Pers. – Britton (1889) reported this species, however we have not examined any historical specimens originally assigned to the taxon. Nonetheless several specimens that likely served as the basis of the report for *O. varia* by Britton (1889) were found to instead belong to *O. atra* (NY-506688, NY-506686, NY-506687).
Opegrapha corticola Coppins & P. James – *Specimen examined*: Cumberland Co., Belleplain State Forest, ~2 mi W of jct NJ347 & CR550/Hoffman Mill Rd., on *Quercus*, J.C. Lendemer 15258 (NY).
Opegrapha vulgata Ach. – Lendemer (2006).
 **Ovicuculospora parmeliae* (Berk. & M.A. Curtis) Etayo - *Specimens examined*: Burlington Co., Wharton State Forest, 0-1 mi N of Batsto, along E shore of Batsto River, 9 Oct. 2004, on *Physcia millegrana* on *Quercus* branch, J.C. Lendemer 3188 (NY); Mt. Misery, E of Mt. Misery Rd. 0.8 mi SE of NJ70 at Mt. Misery Retreat Center, 20 Sept. 2004, on *Parmelia sulcata*, W.R. Buck 47392 (NY). Camden Co., Wharton State Forest, 0-0.5 mi W of CR536/Chew Rd., S shore of Clark Branch, 9 Feb. 2009, on *P. millegrana* on *Quercus* branch, J.C. Lendemer 15473 (NY), on *Punctelia rudecta* on *Quercus*, J.C. Lendemer 15490 (NY). Cumberland Co., Peaslee Wildlife Management Area, ~2.4 mi S of jct NJ49 & CR646/Cumberland Rd., 2 Feb. 2009, on *P. rudecta* on *Quercus*, J.C. Lendemer 15147 (NY); Peaslee Wildlife Management Area, ~1.5 mi N of jct NJ49 & CR671/Union Rd., 2 Feb. 2009, on *P. rudecta* on *Quercus*, J.C. Lendemer 15072 (NY); Belleplain State Forest, ~2 mi W of jct347 & CR550/Hoffman Mill Rd., 3 Feb. 2009, on *P. rudecta* on *Quercus*, J.C. Lendemer 15240 (NY); Edward C. Bevin/Millville Wildlife Management Area, Buckshutem Swamp, 17 Feb. 2012, on *P. rudecta* on *Acer*, J.C. Lendemer et al. 30448 (NY). Salem Co., Parvin State Park, vicinity of Muddy Run, 26 Dec. 2008, on *P. rudecta* on *Acer*, J.C. Lendemer et al. 15019 (NY).
- Pannaria lurida* subsp. *russellii* (Tuck.) P.M. Jørg. – *Specimens examined*: County unspecified, without locality, C.F. Austin s.n. (NY). Bergen Co., Palisades, C.F. Austin s.n. (NY).
Pannaria rubiginosa (Thunb.) Delise – Britton (1889), Lendemer (2006).
Parmelia squarrosa Hale – Harris (1985), Lendemer (2004, 2006).
Parmelia sulcata Taylor – Moldenke (1934a, 1935), Lendemer (2004, 2006), Struwe et al. (2014), Waters & Lendemer (in rev.).
Parmeliella triptophylla (Ach.) Müll. Arg. – Britton (1889, as *Pannaria tryptophylla*).
Parmeliopsis subambigua Gyeln. – Britton (1889, as *Parmelia ambigua*), Harris (1985, as *Foraminella subambigua*), Lendemer (2004, 2006).
Parmotrema austrosinense (Zahlbr.) Hale – Waters & Lendemer (in rev.).
Parmotrema cetratum (Ach.) Hale – Britton (1889, as *Parmelia cetrata*), Little (1951, as *Parmelia cetrata*).
Parmotrema crinitum (Ach.) M. Choisy – Britton (1889, as *Parmelia crinita*), Wood (1914, as *Parmelia crinita*), Lendemer (2015b).

- Parmotrema gardneri* (Dodge) Sérus. – Lendemer (2004), Waters & Lendemer (in rev.).
- Parmotrema hypoleucinum* (J. Steiner) Hale – Lendemer (2006), Waters & Lendemer (in rev.).
- Parmotrema hypotropum* (Nyl.) Hale – Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Parmotrema perforatum* (Jacq.) A. Massal. – Britton (1889, as *Parmelia perforata*), Wood (1914, as *P. perforata*), Little (1951, as *P. perforata*), Harris (1985), Lendemer (2006), Struwe et al. (2014).
- Parmotrema perlatum* (Huds.) M. Choisy – Waters & Lendemer (in rev.).
- Parmotrema reticulatum* (Taylor) M. Choisy – Harris (1985), Lendemer (2004, as *Rimelia reticulata*), Lendemer (2006), Waters & Lendemer (in rev.).
- Parmotrema subisidiosum* (Müll. Arg.) Hale – Lendemer (2004, as *Rimelia subisidiosa*), Lendemer (2006), Waters & Lendemer (in rev.).
- Parmotrema submarginale* (Michx.) DePriest & B. Hale – Waters & Lendemer (in rev.).
- Parmotrema xanthinum* (Müll. Arg.) Hale – Lendemer (2016).
- Peltigera didactyla* (With.) J.R. Laundon – Britton (1889, as *P. canina* var. *spuria*), Wood (1914, as *P. canina* var. *spuria*), Hastings (1940, as *P. spuria*), Lendemer (2006), Struwe et al. (2014).
- Peltigera elisabethae* Gyeln. – *Specimens examined*: Bergen Co., Closter, [C.F. Austin] 266 (NY), C.F. Austin s.n. (NY), C.F. Austin 171 (NY). Camden Co., locality unspecified, C.F. Austin s.n. (NY).
- Peltigera hydrothyria* Miadl. & Lutzoni – Britton (1889, as *Hydrothyria venosa*).
- Peltigera horizontalis* (Huds.) Baumg. – Britton (1889).
- Peltigera leucophlebia* (Nyl.) Gyeln. – *Specimen examined*: Without specific locality, on banks in woods, C.F. Austin s.n. (NY, likely source of original report of *P. aphthosa* by Britton (1889)).
- Peltigera neckeri* Müll. Arg. – *Specimens examined*: Bergen Co., Closter, C.F. Austin 145b (NY), C.F. Austin s.n. (NY). Sussex Co., Andover, 21 Aug. 1931, G.P. Anderson s.n. (NY).
- Peltigera neopolydactyla* (Gyeln.) Gyeln. – *Specimen examined*: Burlington Co., Riverton, Sept. 1876, collector unspecified s.n. (NY).
- Peltigera praetextata* (Flörke ex Sommerf.) Zopf – Moldenke (1935, as *P. subcanina*), Moldenke (1935), Waters & Lendemer (in rev.).
- Peltigera rufescens* (Weiss) Humb. – Britton (1889), Wood (1914).
- Pertusaria globularis* (Ach.) Tuck. – Britton (1889).
- Pertusaria macounii* (Lamb) Dibben – Harris (1985), Lendemer (2006).
- Pertusaria ostiolata* Dibben – Harris (1985).
- Pertusaria paratuberculifera* Dibben – Harris (1985), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Pertusaria plittiana* Erichsen – *Specimens examined*: Without specific locality, 1866, C.F. Austin 22 (NY). Bergen Co., Closter, C.F. Austin 333 (NY), C.F. Austin 342 (NY), C.F. Austin 347 (NY); Palisades, Apr. 1876, C.F. Austin s.n. (NY). Hunterdon Co., Delaware Twp., between Upper Creek Rd. and Pine Hill Rd., 3-4 Nov. 1992, on rock, W.R. Buck 22214 (NY), 4 Nov. 1992, on rock, R.C. Harris 29029 (NY). Sussex Co., Quarryville, 18 Oct. 1934, G.P. Anderson s.n. (NY).
- Pertusaria pustulata* (Ach.) Duby – Britton (1889), Lendemer (2004, 2006), Waters & Lendemer (in rev.).

Pertusaria subpertusa Brodo – Lendemer (2004).

+*Phaeocalicium polyporaenum* (Nyl.) Tibell – Thomson (1935, as *Calicium polyporeum*), Harris (1985), Lendemer (2006), Waters & Lendemer (in rev.).

Phaeographis erumpens (Nyl.) Müll. Arg. – *Specimens examined*: Cape May Co., Belleplain State Forest, ~1.25 mi W of jct of NJ550 (spur) and Cedar Bridge Rd., 3 Feb. 2009, on *Ilex* branch, J.C. Lendemer 15270 (NY); Peaslee Wildlife Management Area, ~3.75 mi W of jct NJ49 & CR548/Weatherby Rd., 2 Feb. 2009, on *Quercus* branch, J.C. Lendemer 15203A (NY). Cumberland CO., Belleplain State Forest, ~2 mi W of jct NJ347 & CR550/Hoffman Mill Rd., 3 Feb. 2009, on *Quercus* branch, J.C. Lendemer 15241A (NY). Salem Co., Parvin State Park, vicinity of Muddy Run, 26 Dec. 2008, on *Ilex* branch, J.C. Lendemer et al. 15016 (NY).

Phaeographis inusta (Ach.) Müll. Arg. – Harris (1985), Lendemer (2004, 2006).

Phaeophyscia adiastrata (Essl.) Essl. – Lendemer (2004, 2006), Waters & Lendemer (in rev.).

Phaeophyscia hirsuta (Mereschk.) Essl. – Lendemer (2006).

Phaeophyscia pusilloides (Zahlbr.) Essl. – Waters & Lendemer (in rev.).

Phaeophyscia rubropulchra (Degel.) Essl. – Britton (1889, as *Physcia obscura* var. *endochrysea*), Wood (1914, as *Physcia obscura* var. *endochrysea*), Moldenke (1935, as *Physcia endochrysea*), Harris (1985), Lendemer (2004, 2006), Waters & Lendemer (in rev.).

Phaeophyscia sciastra (Ach.) Moberg – *Specimen examined*: Sussex Co., Ogdensburgh, 1875, C.F. Austin 696 (NY).

Phaeophyscia squarrosa Kashiw. – Kiviat & MacDonald (2002, as *P. imbricata*).

**Phaeosporobolus alpinus* R. Sant., Alstrup & D. Hawksw. – *Specimens examined*: Atlantic Co., Tuckahoe Wildlife Management Area, gravel road 0.05 mi E of jct w/ Griscom Mill Rd., 2 Dec. 2009, on *Pertusaria pustulata* on *Quercus*, J.C. Lendemer 20032 (NY). Cape May Co., Peaslee Wildlife Management Area, 0.75 mi NW of jct NJ49 & CR548/Weatherby Rd., 2 Feb. 2009, on *P. pustulata* on *Quercus*, J.C. Lendemer 15224B (NY).

Phyllopsora corallina (Eschw.) Müll. Arg. – *Specimens examined*: Bergen Co., Closter, 1865, C.F. Austin 310 (NY).

Physcia adscendens (Fr.) H. Olivier – Lendemer (2004, 2006), Waters & Lendemer (in rev.).

Physcia aipolia (Humb.) Fürnr. – *Specimen examined*: Atlantic Co., Wharton State Forest, Batsto, 0.5 mi E of Pleasant Mills, 1 Jul. 2006, on *Juglans*, J.C. Lendemer et al. 7135 (NY).

Physcia americana G. Merr. – Harris (1985), Lendemer (2004, 2006), Waters & Lendemer (in rev.).

Physcia millegrana Degel. – Harris (1985), Forman (1998), Lendemer (2004, 2006), Struwe et al. (2014), Waters & Lendemer (in rev.).

Physcia pumilior R.C. Harris – Lendemer (2006), Waters & Lendemer (in rev.).

Physcia stellaris (L.) Nyl. – Britton (1889), Wood (1914), Torrey (1933), Moldenke (1935), Forman (1998), Lendemer (2004), Waters & Lendemer (in rev.).

Physcia subtilis Degel. – Esslinger (2017), Waters & Lendemer (in rev.). – Note that the report of *P. subtilis* by Lendemer (2004) may refer to either *P. subtilis* or *P. thomsoniana* as the two species were not recognized at the time of that publication.

Physcia thomsoniana Essl. – Esslinger (2017), Waters & Lendemer (in rev.).

Physciella chloantha (Ach.) Essl. – Kiviat & MacDonald (2002), Lendemer (2004, 2006), Waters & Lendemer (in rev.).

Physciella melanchra (Hue) Essl. – Waters & Lendemer (in rev.).

- Physconia leucoleptes* (Tuck.) Essl. – Lendemer (2006), Waters & Lendemer (in rev.).
- Placidium arboreum* (Schw. ex Michener) Lendemer – Britton (1889, as *Endocarpon arboreum*), Lendemer (2006).
- Placidium pilosellum* (Breuss) Breuss – *Specimen examined*: Camden Co., “the other side of Haddington”, 20 Jul. 1837, C.F. Austin (NY).
- Placidium squamulosum* (Ach.) Breuss – *Specimens examined*: Bergen Co., Palisades along the Hudson River, Jan. 1874, C.F. Austin s.n. (NY). Camden Co., “the other side of Haddington”, 20 Jul. 1837, C.F. Austin (NY). Sussex Co.: Roys, 1937, G.G. Nearing s.n. (NY). Warren Co., White Lake, 1937, G.G. Nearing s.n. (NY).
- Placynthiella dasaea* (Stirt.) Tønsberg – Lendemer (2006), Waters & Lendemer (in rev.).
- Placynthiella icmalea* (Ach.) Coppins & P. James – Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Placynthiella oligotropha* (J.R. Laundon) Coppins & P. James – Harris (1985), Lendemer (2004, 2006).
- Placynthiella uliginosa* (Schrad.) Coppins & P. James – Britton (1889, as *Biatora uliginosa*), Moldenke (1935, as *Lecidea uliginosa*), Harris (1985), Forman (1998, as *L. uliginosa*), Lendemer (2004, 2006), Howe (2016, as *L. uliginosa*).
- Placynthium nigrum* (Huds.) S.F. Gray – Britton (1889, as *Pannaria nigra*), Wood (1914, as *Pannaria nigra*), Lendemer (2006).
- Platismatia glauca* (L.) W.L. Culb. & C.F. Culb. – Britton (1889, as *Cetraria glauca*), Wood (1914, as *Platysma glaucum*).
- Platismatia tuckermanii* (Oakes) W.L. Culb. & C.F. Culb. – Britton (1889, as *Cetraria lacunosa*), Torrey (1933a, as *C. lacunosa*), Little (1951, as *C. lacunosa*), Thomson (1935, as *C. atlantica*), Lendemer (2004).
- Polysporina simplex* (Taylor) Vězda – Britton (1889, as *Lecanora simplex*).
- Porpidia albocaerulescens* (Wulfen) Hertel & Knoph – Moldenke (1934a, 1935, as *Lecidea albocaerulescens*), Hastings (1940, as *L. albocaerulescens*), Waters & Lendemer (in rev.).
- Porpidia albocaerulescens* (Wulfen) Hertel & Knoph var. *polycarpiza* (Vain.) Rambold & Hertel – Harris & Lendemer (2006).
- Porpidia crustulata* (Ach.) Hertel & Knoph – Lendemer (2004).
- Porpidia macrocarpa* (DC.) Hertel & A.J. Schwab – Britton (1889, as *Lecidea contigua*), Moldenke (1934a, 1935, as *Lecidea contigua*).
- Protoblastenia rupestris* (Scop.) J. Steiner – Britton (1889, as *Placodium rupestre*).
- Protoparmeliopsis muralis* (Schreb.) M. Choisy – Britton (1889, as *Lecanora muralis*), Moldenke (1935, as *L. muralis*).
- Pseudevernia consocians* (Vain.) Hale & W.L. Culb. – *Specimens examined* (original reports of *Evernia furfuracea*): Without locality or date, C.F. Austin s.n. (NY), Jun. 1869, C.F. Austin s.n. (NY); “Pines of N.J.”, without date, C.F. Austin s.n. (NY). Bergen Co., Closter, Apr. 1876, C.F. Austin s.n. (NY).
- Pseudosagedia cestrensis* (Tuck. ex E. Michener) R.C. Harris – Britton (1889, as *Sagedia cestrensis*), Harris (1985, as *Porina cestrensis*), Lendemer (2004, as *Trichothelium cestrensis*), Waters & Lendemer (in rev.).
- Pseudosagedia chlorotica* (Ach.) Hafellner & Kalb – Britton (1889, as *Sagedia chlorotica*).
- Pseudosagedia guentheri* (Flot.) Hafellner & Kalb – Waters & Lendemer (in rev.).
- Pseudosagedia raphidosperma* (Müll. Arg.) R.C. Harris – Lendemer (2006).
- Psilolechia lucida* (Ach.) M.Choisy – Waters & Lendemer (in rev.).

- Psora icterica* (Mont.) Müll. Arg. – Britton (1889, as *Biatora icterica*), Wood (1914, as *B. icterica*), Lendemer (2008).
- Psora decipiens* (Hedw.) Hoffm. – *Specimen examined*: Warren Co., Hope, 1937, G.G. Nearing s.n. (NY).
- Psora pseudorussellii* Timdal – *Specimens examined*: Sussex Co., Ogdensburg, C.F. Austin s.n. (NY); [Ogdensburg?] zinc mines, without date or collector (NY); without locality or collector, 1871, (NY).
- Psoroglaena dictyospora* (Orange) Harada – Lendemer (2006).
- Psorula rufonigra* (Tuck.) Gotth. Schneid. – Britton (1889, as *Biatora rufo-nigra*), Wood (1914, as *B. rufo-nigra*).
- Psorotichia schaeferi* (A. Massal.) Arnold – Britton (1889, as *Pyrenopsis schaeferi*).
- Punctelia caseana* Lendemer & Hodgkinson – Harris (1985, as *P. subrudecta*), Lendemer (2004, 2006, as *P. subrudecta*), Struwe et al. (2014), Waters & Lendemer (in rev.).
- Punctelia missouriensis* G.Wilh. & Ladd – Waters & Lendemer (in rev.).
- Punctelia rudecta* (Ach.) Krog – Britton (1889, as *Parmelia borreri* var. *rudecta*), Moldenke (1934a, 1935, as *Parmelia rudecta*), Thomson (1935, as *Parmelia rudecta*), Hastings (1940, as *Parmelia rudecta*), Little (1951, as *Parmelia rudecta*), Forman (1998, as *Parmelia rudecta*), Olsson (1998, as *Parmelia rudecta*), Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Pycnothelia papillaria* Dufour – Britton (1889, as *Cladonia papillaria*), Evans (1935, 1938, 1940, as *C. papillaria*), Moldenke (1939, 1940, as *C. papillaria*), Hastings (1940, as *C. papillaria*), Harris (1985), Forman (1998), Lendemer (2004, 2006).
- Pyrenopsis phaeococca* (Tuck.) Tuck. – Britton (1889).
- Pyrenula pseudobufonia* (Rehm) R.C. Harris – Harris (1985), Lendemer (2004, 2006).
- Pyrenula punctella* (Nyl.) Trevis. – *Specimen examined*: Bergen Co., Closter, C.F. Austin 124b (NY).
- Pyrrhospora varians* (Ach.) R.C. Harris – *Lecidea varians* Ach. – Britton (1889, as *Biatora varians*), Harris (1985), Lendemer (2004, 2006), Struwe et al. (2014), Waters & Lendemer (in rev.).
- Pyxine soorediata* (Ach.) Mont. – Britton (1889), Moldenke (1935), Harris (1985), Lendemer (2004, 2006).
- Pyxine subcinerea* Stirt. – Lendemer (2004, 2006), Waters & Lendemer (in rev.).
- Ramalina americana* Hale – Waters & Lendemer (in rev.).
- Ramalina culbersoniorum* LaGreca – Waters & Lendemer (in rev.).
- Ramalina farinacea* (L.) Ach. – Waters & Lendemer (in rev.).
- Ramalina intermedia* (Nyl.) Nyl. – *Specimens examined*: Passaic Co., Little Falls, May 1869, C.F. Austin 587 (NY). Sussex Co., location unspecified, C.F. Austin s.n. (NY).
- Ramalina petrina* Bowler & Rundel – *Specimens examined*: Bergen Co., Closter, C.F. Austin s.n. (NY).
- Ramboldia russula* (Ach.) Kalb, Lumbsch & Elix – Britton (1889, as *Biatora russula*).
- Ramonia microspora* Vězda – *Specimens examined*: Cumberland Co., Bear Swamp West, 0.2 mi E of N-S trail at point ~0.4 mi SE of Ackley Rd./CR718, 17 Feb. 2012, on *Acer*, J.C. Lendemer et al. 30480 (NY), J.C. Lendemer et al. 30482 (NY), on large *Acer*, J.C. Lendemer et al. 30484 (NY).
- Rhizocarpon cinereovirens* (Müll. Arg.) Vain. – (Moldenke 1934a, 1935).

Rhizocarpon grande (Flörke ex Flot.) Arnold – Britton (1889, as *Buellia petraea*).

Rhizocarpon reductum Th. Fr. – Lendemer (2006).

Rhizoplaca subdiscrepans (Nyl.) R. Sant. – *Specimens examined*: Passaic Co., Ramapo, 8 Nov. 1942, on rock, G.G. Nearing s.n. (NY). Sussex Co., High Point State Park, 19 Aug. 1977, on rock, C.R. Prince 77-136 (NY).

Rimularia badioatra (Kremp.) Hertel & Rambold – Waters & Lendemer (in rev.).

Rinodina ascociscana (Tuck.) Tuck. – Britton (1889).

Rinodina cana (Arnold) Arnold – *Specimens examined*: Bergen Co., Closter, C.F. Austin 719 (NY). Morris Co., Stephens State Park, 1980, A. Norarevian s.n. (NY).

Rinodina destituta (Nyl.) Zahlbr. – Waters & Lendemer (in rev.).

Rinodina excrescens Vain. – *Specimen examined*: Cumberland Co., Edward C. Bevin/ Millville Wildlife Management Area, Buckshutem Swamp, 17 Feb. 2012, on *Acer*, J.C. Lendemer et al. 30462 (NY).

Rinodina maculans Müll. Arg. – Lendemer (2004, 2006), Waters & Lendemer (in rev.).

Rinodina oxydata (A.Massal.) A. Massal. – Waters & Lendemer (in rev.).

Rinodina subminuta H. Magn. – Lendemer (2004, 2006).

Rinodina tephraspis (Tuck.) Herre – *Specimens examined*: County unknown, without locality, on rock, C.F. Austin 631 (NY). Hunterdon Co., Delaware Twp., between Upper Creek Rd. & Pine Hill Rd., 3-4 Nov. 1992, on rock, W.R. Buck 22216 (NY), 4 Nov. 1992, R.C. Harris 29007 (NY), R.C. Harris 29036 (NY). Sussex Co., High Point State Park, 13 Sept. 1992, on rock, E. Lay 92-0380 (NY). Warren Co., Jenny Jump State Park, 11 Sept. 1992, on rock, W.R. Buck 21534 (NY).

Ropalospora chlorantha (Tuck.) S. Ekman – Britton (1889, as *Biatora chlorantha*), Harris (1985, as *Bacidia chlorantha*), Lendemer (2006).

Ropalospora viridis (Tønsberg) Tønsberg – Lendemer (2011b), Waters & Lendemer (in rev.).

Sarcogyne clavus (DC.) Kremp. – Hastings (1940, as *Biatorella clavus*).

Sarcogyne regularis Körb. – Lendemer (2004, 2006).

Sarcosagium campestre (Fr.) Poetsch & Schied. – Britton (1889, as *Biatora campestris*), Wood (1914, as *B. campestris*).

Sarea resinae (Fr.) Kuntze – Britton (1889, as *Biatora resinae*), Lendemer (2006).

Schismatomma glaucescens (Willey) R.C. Harris – Britton (1889, as *Arthonia glaucescens*), Lendemer (2004, 2006).

Schismatomma graphidioides (Leight.) Zahlbr. – Lendemer (2006, as *S. pericleum*), Lendemer & Harris (2016b).

Scoliciosporum chlorococcum (Stenh.) Vězda – Harris (1985), Lendemer (2004, 2006), Waters & Lendemer (in rev.).

Scoliciosporum pensylvanicum R.C. Harris – Harris (2009).

Scoliciosporum umbrinum (Ach.) Arnold – Britton (1889, as *Biatora umbrina*), Moldenke (1935, as *Bacidia umbrina*), Waters & Lendemer (in rev.).

Scytinium lichenoides (L.) Otálora, P. M. Jørg. & Wedin – Britton (1889, as *Leptogium lacerum*), Wood (1914, as *L. lacerum*).

Segestria leptalea (Durieu & Mont.) R.C. Harris – Lendemer (2006), Waters & Lendemer (in rev.).

**Sphinctrina tubiformis* A. Massal. – Britton (1889, as *Calicium tubaeforme*).

**Sphinctrina turbinata* (Pers.: Fr.) De Not. – Britton (1889, as *Calicium turbinatum*).

Steinia geophana (Nyl.) Stein – Britton (1889, as *Biatora geophana*).

Stenocybe pullatula (Ach.) Stein – Britton (1889, as *Calicium byssaceum*).

Stereocaulon glaucesens Tuck. – Lendemer (2006).

Stereocaulon saxatile H. Magn. – *Specimens examined*: Bergen Co., Palisades, 2 Oct. 1941, W.H. Wiegmann s.n. (NY). Passaic Co., Franklin Clove, Nov. 1934, G.P. Anderson s.n. (NY); Little Falls, 15 Aug. 1896, A. Schneider s.n. (NY). Union Co., Scotch Pines Notch, 15 Aug. 1915, W.H. Wiegmann s.n. (NY).

Stictis urceolatum (Ach.) Gilenstam – Britton (1889, as *Conotrema urceolatum*).

**Stigmidium lendemeri* Kocourk. & K. Knudsen – *Specimen examined*: Sussex Co., Stokes State Forest, Sunrise Mountain summit, 29 Mar. 2008, on *Aspicilia* on rock, J.C. Lendemer et al. 11579 (NY).

+*Stigmidium marinum* (Deakin) Swinscow – Taylor (1982).

Strangospora pinicola (A.Massal.) Körb. – Waters & Lendemer (in rev.).

Strigula americana R.C. Harris – Lendemer (2006).

Teloschistes chrysophthalmus (L.) Th. Fr. – Britton (1889), Wood (1914).

Tephromela atra (Hudson) Hafellner – Britton (1889, as *Lecanora atra*), Wood (1914, as *L. atra*).

Thelocarpon laureri (Flot.) Tuck. – Britton (1889).

Thelotrema subtile Tuck. – Britton (1889), Lendemer (2004).

Thrombium epigaeum (Pers.) Wallr. – Britton (1889, as *Verrucaria epigaea*).

+*Tomasellia americana* (Willey) R.C. Harris – *Specimens examined*: Cumberland Co., Vineland Twp., E side of NJ55 just N of Landis Ave./NJ56, 9 Apr. 2000, on young *Quercus* branch, W.R. Buck 36848 (NY). Ocean Co., Island Beach State Park, Island Beach Northern Nature Area, 10 Apr. 2000, on young *Quercus* branch, W.R. Buck 36894 (NY).

Trapelia coarctata (Turner) M. Choisy – Britton (1889, as *Biatora coarctata*), Moldenke (1935, as *Lecanora coarctata*), Brodo & Lendemer (2015).

Trapelia glebulosa (Sm.) J.R. Laundon – Lendemer (2006), Brodo & Lendemer (2015).

Trapelia placodioides Coppins & P. James – Lendemer (2006), Waters & Lendemer (in rev.).

Trapelia stipitata Brodo & Lendemer – Brodo & Lendemer (2015).

Trapeliopsis flexuosa (Fr.) Coppins & P. James – Harris (1985), Lendemer (2004, 2006), Waters & Lendemer (in rev.).

Trapeliopsis granulosa (Hoffm.) Lumbsch – Britton (1889, as *Biatora granulosa*), Harris (1985), (1985), Forman (1998, as *Lecidea granulosa*), Howe (2016, as *L. granulosa*).

Trapeliopsis viridescens (Schrad.) Coppins & P. James – Britton (1889, as *Biatora viridescens*), Moldenke (1935, as *Lecanora viridescens*).

**Tremella pertusariae* Diederich – *Specimen examined*: Cape May Co., Peaslee Wildlife Management Area, ~3.75 mi W of jct NJ49 & CR548/Weatherby Rd., 2 Feb. 2009, on *Pertusaria pustulata* on *Quercus*, J.C. Lendemer 15201 (NY).

Trypethelium virens Tuck. ex Michener – Britton (1889), Wood (1914), Nearing (1940), Harris (1985), Lendemer (2004), Waters & Lendemer (in rev.).

Tuckermanella fendleri (Tuck.) Essl. – Britton (1889, as *Cetraria fendleri*), Wood (1914, as *Platysma fendleri*), Lendemer (2004, 2006).

Tuckermanopsis americana (Spreng.) Hale – Lendemer (2004).

Tuckermanopsis ciliaris (Ach.) Gyeln. – Britton (1889, as *Cetraria ciliaris*), Torrey (1933a, as *Nephromopsis ciliaris*), Thomson (1935, as *N. ciliaris*), Little (1951, as *C. ciliaris*), Harris (1985), Lendemer (2004, 2006).

Umbilicaria mammulata (Ach.) Tuck. – Britton (1889, as *U. dillenii*), Hastings (1940, as *Gyrophora dillenii*), Niering (1953).

Umbilicaria muhlenbergii (Ach.) Tuck. – Britton (1889), Hastings (1940, as *Gyrophora muhlenbergii*), Niering (1953, as *Actinogyra muhlenbergii*).

Usnea angulata Ach. – Britton (1889), Wood (1914).

Usnea ceratina Ach. – Britton (1889, as *U. barbata* var. *ceratina*), Wood (1914, as *U. barbata* var. *ceratina*).

Usnea mutabilis Stirt. – Lendemer (2004, 2006).

Usnea merrillii Motyka – *Specimen examined*: County unknown, “Pines of N.J.”, 1863, C.F. Austin s.n. (NY).

Usnea rubicunda Stirt. – Britton (1889, as *U. strigosa* var. *rubiginea*), Lendemer (2006, as *U. pensylvanica*).

Usnea strigosa (Ach.) Eaton – Britton (1889), Harris (1985), Lendemer (2004, 2006).

Usnea subscabrosa Nyl. ex Motyka – *Specimen examined*: Burlington Co., Oswego River Preserve, E side of Red Rd./Stevenson Rd., 6 Sept. 2006, on *Chamaecyparis*, J.C. Lendemer 3782B & M.J. Moody (NY).

Usnea trichodea Ach. – Britton (1889), Wood (1914), Lendemer (2004, 2006).

Usnocetraria oakesiana (Tuck.) M.J. Lai & C.J. Wei – Hastings (1940, as *Cetraria oakesiana*).

Vahliella leucophaea (Vahl) P.M. Jørg. – Britton (1889, as *Pannaria microphylla*).

Varicellaria velata (Turner) Schmitt & Lumbsch – Britton (1889, as *Pertusaria velata*), Wood (1914, as *P. velata*), Torrey (1933a, as *P. velata*), Thomson (1935, as *P. velata*), Harris (1985, as *P. velata*), Lendemer (2006, as *P. velata*).

Verrucaria calkinsiana Servít – Lendemer (2004).

Verrucaria muralis Ach. – Britton (1889), Lendemer (2006).

Vezdaea leprosa (P. James) Vězda – Lendemer (2006).

Violella fucata (Stirt.) T. Sprib. – Lendemer (2004, 2006, as *Mycoblastus fucatus*).

Vulpicida pinastri (Scop.) J.-E. Mattsson & M.J. Lai – Britton (1889, as *Cetraria juniperina* var. *pinastri*), Wood (1914, as *Platysma juniperina* var. *pinastri*).

Vulpicida viridis (Schwein.) J.-E. Mattsson & M.J. Lai – Britton (1889, as *Cetraria juniperina*), Little (1951, as *C. juniperina*), Torrey (1933a, as *C. viridis*), Harris (1985, as *C. viridis*), Lendemer (2004, 2006).

Wahlenbergiella striatula (Wahlenb.) Gueidan & Thüs – Taylor (1982, as *Verrucaria microspora*).

Willeya diffractella (Tuck.) Müll. Arg. – Britton (1889, as *Staurothele diffractella*), Waters & Lendemer (in rev.).

Xanthomendoza weberi (S. Y. Kondr. & Kärnefelt) L. Lindblom – Lendemer (2004, as *Xanthoria fulva*).

Xanthoparmelia angustiphylla (Gyeln.) Hale – Waters & Lendemer (in rev.).

Xanthoparmelia conspersa (Ehrh. ex Ach.) Hale – Britton (1889, as *Parmelia conspersa*), Wood (1914, as *P. conspersa*), Moldenke (1934a, 1935, as *P. conspersa*), Thomson (1935, as *P. conspersa*), Hastings (1940, as *P. conspersa*), Niering (1953, as *P. conspersa*), Lendemer (2006), Waters & Lendemer (in rev.).

Xanthoparmelia cumberlandia (Gyeln.) Hale – Waters & Lendemer (in rev.).

Xanthoparmelia hypofusca (Gyeln.) Hodgkinson & Lendemer – Hodgkinson & Lendemer (2011).

Xanthoparmelia plittii (Gyeln.) Hale – Kiviat & MacDonald (2002), Zambell et al. (2012), Waters & Lendemer (in rev.).

Xanthoria parietina (L.) Th. Fr. – Britton (1889, as *Teloschistes parietinus*), Waters & Lendemer (in rev.).

Xylographa disseminata Willey – *Specimen examined*: Ocean Co., Lakewood, Apr. 1888, on cedar rail, C.H. Clarke s.n. (NY).

Xylographa opegraphella Nyl. – Britton (1889).

Xylopsora friesii (Ach.) Bendiksby & Timdal – Lendemer (2006, as *Hypocenomyce friesii*).

Zwackhia viridis (Ach.) Poetsch & Schied. – Britton (1889) reported this species, however we have not reviewed any historical vouchers that were correctly named. Nonetheless we have examined one modern collection that does refer to the species: Cumberland Co., Bear Swamp West, 0.2 mi E of N-S trail at point ~0.4 mi SE of Ackley Rd./CR718, 17 Feb. 2012, on *Fagus*, J.C. Lendemer et al. 30477 (NY).

SYNONYMS

This section is intended to serve as a translation table between names used in earlier publications and those used here. Heterotypic synonymies follow Esslinger (2016).

Acolium tigillare (Ach.) Gray = *Cyphelium tigillare*

Actinogyra muhlenbergii (Ach.) Schol. = *Umbilicaria muhlenbergii*

Anaptychia aquila (Ach.) A. Massal. = North American records are *Anaptychia palmulata*

Anaptychia speciosa (Wulfen) A. Massal. = *Heterodermia speciosa*

Anisomeridium nyssigenum (Ellis & Everh.) R.C. Harris = *Anisomeridium polypori*

Arthonia caesia (Flot.) Körb. = *Chrysothrix caesia*

Arthonia glaucescens Willey = *Schismatomma glaucescens*

Arthonia lecideella Nyl. = *Chrysothrix caesia*

Arthonia spectabilis Flot. = *Arthothelium spectabile*

Arthopyrenia halodytes (Nyl.) Arn. = *Collemopsidium halodytes*

Bacidia chlorantha (Tuck.) Fink = *Ropalospora chlorantha*

Bacidia chlorosticta (Tuck.) A. Schneid. = *Micarea chlorosticta*

Bacidia umbrina (Ach.) Bausch = *Scoliciosporum umbrinum*

Baeomyces aeruginosus (Scop.) DC. = *Icmadophila ericetorum*

Baeomyces roseus Pers. = *Dibaeis baeomyces*

Biatora anthracophila (Nyl.) Hafellner = *Carbonicola anthracophila*

Biatora campestris Fr. = *Sarcosagium campestre*

Biatora chlorantha Tuck. = *Ropalospora chlorantha*

Biatora chlorosticta (Tuck.) Tuck. = *Micarea chlorosticta*

Biatora coarctata (Turner) Th. Fr. = *Trapelia coarctata*

Biatora denigrata Fr. = *Micarea denigrata*

Biatora fossarum (Dufour) Mont. = *Biatorella hemisphaerica*

Biatora geophana (Nyl.) Th. Fr. = *Steinia geophana*

Biatora granulosa (Hoffm.) Flot. = *Trapeliopsis granulosa*

Biatora hypnophila (Ach.) Lönnr. = *Bilimbia sabuletorum*

Biatora icterica Mont. = *Psora icterica*

Biatora resinae (Fr.) Tuck. = *Sarea resinae*

- Biatora rufonigra* Tuck. = *Psorula rufonigra*
Biatora rubella (Hoffm.) Rabenh. = *Bacidia rubella*
Biatora russula (Ach.) Mont. = *Ramboldia russula*
Biatora uliginosa (Schrad.) Fr. = *Placynthiella uliginosa*
Biatora umbrina (Ach.) Tuck. = *Scoliciosporum umbrinum*
Biatora varians (Ach.) Eschw. = *Lecidea varians*
Biatora viridescens (Schrad.) W. Mann = *Trapeliopsis viridescens*
Biatorella clavus (DC.) Th. Fr. = *Sarcogyne clavus*
Buellia myriocarpa (DC.) De Not. = *Amandinea punctata*
Buellia polyspora (Willey) Vain. = *Amandinea polyspora*
Calicium byssaceum Fr. = *Stenocybe pullatula*
Calicium curtum Sm. = *Calicium abietinum*
Calicium fuscipes Tuck. = *Mycocalicium fuscipes*
Calicium phaeocephalum (Turn.) Fr. = *Chaenotheca phaeocephala*
Calicium polyporaeum Nyl. = *Phaeocalicium polyporaeum*
Calicium roscidum (Ach.) Ach. = *Calicium adpersum*
Calicium roscidum var. *rosoidulum* Nyl. = *Calicium adpersum*
Calicium subquercinum Asahina = *Calicium lenticulare*
Calicium subtile Fr. = *Mycocalicium subtile*
Calicium tubaeforme Pers. = *Sphinctrina tubiformis*
Calicium turbinatum Pers. = *Sphinctrina turbinata*
Cetraria aleurites (Ach.) Th. Fr. = *Imshaugia aleurites*
Cetraria aleurites var. *placorodia* (Ach.) Tuck. = *Imshaugia placorodia*
Cetraria atlantica (Tuck.) Du Rietz = *Platismatia tuckermanii*
Cetraria aurescens Tuck. = *Ahtiana aurescens*
Cetraria ciliaris Ach. = *Tuckermanopsis ciliaris*
Cetraria fendleri (Nyl.) Tuck. = *Tuckermanella fendleri*
Cetraria glauca (L.) Fr. = *Platismatia glauca*
Cetraria juniperina var. *pinastri* (Scop.) Ach. = *Vulpicida pinastri*
Cetraria oakesiana Tuck. = *Usnocetraria oakesiana*
Cetraria placorodia (Ach.) Tuck. = *Imshaugia placorodia*
Cetraria viridis Schwein. = *Vulpicida viridis*
Cladonia bacillaris (Ach.) Genth = *C. macilenta* var. *bacillaris*
Cladonia bacillaris f. *abbreviata* Vain. = *C. macilenta* var. *bacillaris*
Cladonia bacillaris f. *clavata* (Ach.) Vain. = *C. macilenta* var. *bacillaris*
Cladonia bacillaris f. *subtomentosula* Sandst. = *C. macilenta* var. *bacillaris*
Cladonia borbonica Nyl. = *C. cylindrica*
Cladonia borbonica f. *cylindrica* A. Evans = *C. cylindrica*
Cladonia capitata f. *imbricata* (Nyl.) A. Evans = *C. peziziformis*
Cladonia caroliniana f. *dimorphoclada* (Robbins) A. Evans = *C. dimorphoclada*
Cladonia delicata (Ehrh.) Flörke = *C. parasitica*
Cladonia delicata f. *quercina* (Pers.) Vain. = *C. parasitica*
Cladonia floerkeana f. *carcata* (Ach.) J.W. Thomson = *C. floerkeana*
Cladonia floerkeana f. *intermedia* (Vain.) J.W. Thomson = *C. floerkeana*
Cladonia mitrula Tuck. = *C. peziziformis*
Cladonia mitrula f. *imbricatula* (Nyl.) Vain. = *C. peziziformis*
Cladonia mitrula f. *pallida* Robbins = *C. peziziformis*

- Cladonia mitrula* f. *squamulosa* G. Merr. = *C. peziziformis*
Cladonia nemoxyna Ach. = *C. rei*
Cladonia nemoxyna f. *fibula* (Ach.) A. Evans = *C. rei*
Cladonia nemoxyna f. *rei* Anders = *C. rei*
Cladonia papillaria (Ehrh.) Hoffm. = *Pycnothelia papillaria*
Cladonia papillaria f. *molariformis* (Hoffm.) Schaer. = *Pycnothelia papillaria*
Cladonia papillaria f. *stipata* Harm. = *Pycnothelia papillaria*
Cladonia pityrea (Flörke) Fr. = *C. ramulosa*
Cladonia pityrea var. *zwackhii* f. *subacuta* Vain. = *C. ramulosa*
Cladonia vulcanica Zoll. & Moritzi = *C. didyma* var. *vulcanica*
Cladonia vulcanica f. *minor* Robbins = *C. didyma* var. *vulcanica*
Collema cyrtaspis Tuck. = *Enchylium conglomeratum*
Collema furvum (Ach.) DC. = *Lathagrium fuscovirens*
Collema myriococcum (Ach.) Ach. = *Lempholemma polyanthes*
Collema pycnocarpum Nyl. = *Enchylium conglomeratum*
Collema rupestre (F. Desp.) Rabenh. = *Collema flaccidum*
Collema tenax (Sw.) Ach. - *Enchylium tenax*
Conotrema urceolatum (Ach.) Tuck. = *Stictis urceolatum*
Crocynia neglecta (Nyl.) Hue = *Lepraria neglecta*
Endocarpon arboreum Tuck. = *Placidium arboreum*
Foraminella subambigua (Gyeln.) S.L.F. Mey. = *Parmeliopsis subambigua*
Gyalecta pineti (Ach.) Tuck. = *Coenogonium pineti*
Gyrophora dillenii (Tuck.) Müll. Arg. = *Umbilicaria mammulata*
Gyrophora muhlenbergii Ach. = *Umbilicaria muhlenbergii*
Hydrothyria venosa J.L. Russell. = *Peltigera hydrothyria*
Hypocenomyce anthracophila (Nyl.) P. James & Gotth. Schneid. = *Carbonicola anthracophila*
Hypocenomyce friesii (Ach.) P. James & Gotth. Schneid. = *Xylopsora friesii*
Lecanora atra (Huds.) Ach. = *Tephromela atra*
Lecanora caesiorubella subsp. *prolifera* (Fink) R.C. Harris = *Lecanora subpallens*
Lecanora cinerea (L.) Sommerf. = *Aspicilia cinerea*
Lecanora coarctata (Turner) Ach. = *Trapelia coarctata*
Lecanora cupressi Tuck. = *Lecanora cupressi*
Lecanora dispersa (Pers.) Röhl. = *Myriolecis dispersa*
Lecanora fuscata Röhl. = *Acarospora fuscata*
Lecanora hagenii (Ach.) Ach. = *Myriolecis hagenii*
Lecanora lacustris (With.) Nyl. = *Ionaspis lacustris*
Lecanora muralis (Schreb.) Rabenh. = *Protoparmeliopsis muralis*
Lecanora simplex (Taylor.) Nyl. = *Polysporina simplex*
Lecanora viridescens (A. Massal.) Müll. Arg. = *Trapeliopsis viridescens*
Lecidea albocaerulescens (Wulfen) Ach. = *Porpidia albocaerulescens*
Lecidea berengeriana (A. Massal.) Nyl. = *Mycobilimbia berengeriana*
Lecidea contigua (Hoffm.) Fr. = *Porpidia macrocarpa*
Lecidea erratica Körber = *Leimonis erratica*
Lecidea granosa Tuck. = *Bacidia granosa*
Lecidea granulosa (Hoffm.) Ach. = *Trapeliopsis granulosa*
Lecidea tessellina Tuck. = *Lecanora oreinoides*
Lecidea uliginosa (Schrad.) Ach. = *Placynthiella uliginosa*

- Lecidea vernalis* (L.) Ach. = *Biatora vernalis*
Loxospora pustulata (Brodo & W.L. Culb.) R.C. Harris = *Lepra pustulata*
Melanelia subaurifera (Nyl.) Essl. = *Melanelixia subaurifera*
Micarea erratica (Körber) Hertel, Rambold & Pietschm. = *Leimonis erratica*
Mycoblastus fucatus (Stirt.) Zahlbr. = *Violella fucata*
Nephromopsis ciliaris (Ach.) Hue = *Tuckermanopsis ciliaris*
Opegrapha varia Pers. = *Alyxoria varia*
Opegrapha varia var. *rimalis* (Pers.) Fr. = *Alyxoria varia*
Opegrapha viridis (Ach.) Behlen & Desberger = *Zwackhia viridis*
Pannaria byssina (Hoffm.) Nyl. = *Leptogium byssinum*
Pannaria microphylla (Sw.) A. Massal. = *Vahliella leucophaea*
Pannaria leucosticta Tuck. = *Fuscopannaria leucosticta*
Pannaria nigra (Huds.) Nyl. = *Placynthium nigrum*
Parmelia ambigua var. *halei* Tuck. = *Parmeliopsis subambigua*
Parmelia borrieri var. *rudecta* (Ach.) Tuck. = *Punctelia rudecta*
Parmelia caperata (L.) Ach. = *Flavoparmelia caperata*
Parmelia cetrata Ach. = *Parmotrema cetratum*
Parmelia colpodes (Ach.) Ach. = *Anzia colpodes*
Parmelia conspersa (Ach.) Ach. = *Xanthoparmelia conspersa*
Parmelia conspersa f. *isidiata* Anzi = *Xanthoparmelia conspersa*
Parmelia conspersa var. *isidiata* (Anzi) E.C. Berry = *Xanthoparmelia conspersa*
Parmelia crinita Ach. = *Parmotrema crinitum*
Parmelia perforata (Jacq.) Ach. = *Parmotrema perforatum*
Parmelia pertusa Schaer. = *Menegazzia terebrata*
Parmelia physodes (L.) Ach. = *Hypogymnia physodes*
Parmelia rudecta Ach. = *Punctelia rudecta*
Parmelinopsis horrescens (Taylor) Elix & Hale = *Hypotrachyna horrescens*
Parmelinopsis minarum (Vain.) Elix & Hale = *Hypotrachyna minarum*
Parmeliopsis aleurites (Ach.) Nyl. = *Imshaugia aleurites*
Parmeliopsis placorodia (Ach.) Nyl. = *Imshaugia placorodia*
Peltigera canina var. *spuria* (Ach.) Schaer. = *Peltigera didactyla*
Peltigera spuria (Ach.) DC. = *Peltigera didactyla*
Pertusaria amara (Ach.) Nyl. = *Lepra amara*
Pertusaria multipunctoides Dibben = *Lepra multipunctoides*
Pertusaria ophthalmiza (Nyl.) Nyl. = *Lepra ophthalmiza*
Pertusaria velata (Turner) Nyl. = *Varicellaria velata*
Physcia adglutinata (Flörke) Nyl. = *Hyperphyscia adglutinata*
Physcia aquila var. *detonsa* (Fr.) Tuck. = *Anaptychia palmulata*
Physcia endochrysea (Nyl.) Hampe = *Phaeophyscia rubropulchra*
Physcia hypoleuca (Ach.) Tuck. = *Heterodermia hypoleuca*
Physcia obscura var. *endochrysea* Nyl. = *Phaeophyscia rubropulchra*
Physcia speciosa (Wulfen) Nyl. = *Heterodermia speciosa*
Placodium camptidium (Tuck.) Tuck. = *Caloplaca camptidia*
Placodium cerinum (Hedw.) Hepp. = *Caloplaca cerina*
Placodium microphyllum Tuck. = *Caloplaca microphyllum*
Placodium rupestre (Scop.) Branth & Rostr. = *Protoblastenia rupestris*
Placodium vitellinum (Hoffm.) Hepp = *Candelariella vitellina*

Platysma aurescens (Tuck.) Nyl. = *Ahtiana aurescens*
Platysma fendleri Nyl. = *Tuckermanella fendleri*
Platysma glaucum (L.) Frege = *Platismatia glauca*
Platysma juniperinum var. *pinastri* (Scop.) Nyl. = *Vulpicida pinastri*
Porina cestrensis (Tuck.) Müll. Arg. = *Pseudosagedia cestrensis*
Pseudophyscia aquila var. *detonsa* (Fr.) R. Howe = *Anaptychia palmulata*
Pseudophyscia hypoleuca (Ach.) Hue. = *Heterodermia hypoleuca*
Pseudophyscia speciosa (Wulfen) Müll. Arg. = *Heterodermia speciosa*
Punctelia subrudecta auct. Amer. = *Punctelia caseana*
Pyrenopsis schaeferi (A. Massal.) Nyl. = *Psorotichia schaeferi*
Pyrenula punctiformis (Schrank) Trevis. = *Naetrocymbe punctiformis*
Rimelia reticulata (Taylor) Hale & A. Fletcher = *Parmotrema reticulatum*
Rimelia subisidiosa (Müll. Arg.) Hale & A. Fletcher = *Parmotrema subisidiosum*
Rinodina milliaria Tuck. = *Amandinea milliaria*
Rinodina oreina (Ach.) Mass. = *Dimelaena oreina*
Sagedia cestrensis Tuck. = *Pseudosagedia cestrensis*
Sagedia chlorotica (Ach.) A. Massal. = *Pseudosagedia chlorotica*
Staurothele diffractella (Nyl.) Tuck. = *Willeya diffractella*
Sticta aurata Ach. = *Crocodia aurata*
Sticta pulmonaria (L.) Bioli = *Lobaria pulmonaria*
Sticta quercizans (Michx.) Ach. = *Lobaria quercizans*.
Teloschistes concolor (Dicks.) Tuck. = *Candelaria concolor*
Teloschistes parietinus (L.) Norman = *Xanthoria parietina*
Trichothelium cestrensis (Tuck.) R.C. Harris = *Pseudosagedia cestrensis*
Umbilicaria dillenii Tuck. = *U. mammulata*
Umbilicaria pensylvanica Hoffm. = *Lasallia pensylvanica*
Urceolaria scruposa (Schreb.) Ach. = *Diploschistes scruposus*
Usnea barbata var. *ceratina* (Ach.) Schaer. = *Usnea ceratina*
Usnea pensylvanica Motyka = *Usnea rubicunda*
Verrucaria epigaea (Pers.) Ach. = *Thrombium epigaeum*
Verrucaria microspora Nyl. = *Wahlenbergiella striatula*

Excluded Taxa and Questionable Historical Reports

Acarospora glaucocarpa (Wahlenb. ex Ach.) Körb. – Records should be referred to *A. canadensis*.
Alectoria jubata (L.) Tuck. – Reported by Britton (1889) based on unspecific earlier collections made by C.F. Austin and others. Multiple specimens collected by C.F. Austin from New Jersey and identified as this taxon belong to *Bryoria furcellata*.
Alectoria jubata var. *bicolor* Fr. – This taxon is now treated as *Bryoria bicolor* (Ehrh.) Brodo & D. Hawksw., however the report of this species by Britton (1889: 359) based on material collected by Eckfeldt in Sussex County likely refers to *B. furcellata* as the range of *B. bicolor* is not mapped as including New Jersey (Brodo & Hawksworth 1977). No New Jersey specimens originally identified as *A. jubata* var. *bicolor* were located at NY.
Alectoria jubata var. *chalybeiformis* Ach. – This taxon was treated as *Bryoria chalybeiformis* (Ach.) Brodo & D. Hawksw. (Brodo & Hawksworth 1977) but has since been considered a synonym of *B. fuscescens* (Gyeln.) Brodo & D. Hawksw. by Velmala et al. (2014). Regardless, it was not mapped as occurring in New Jersey (Brodo & Hawksworth 1977)

and the report by Britton (1889: 359) based on collections made by Austin in Bergen County and Eckfeldt in Camden and Atlantic Counties likely refers to *B. furcellata*. All New Jersey specimens originally identified as *A. jubata* var. *chalybeiformis* at NY have been reidentified as *B. furcellata*.

Alectoria jubata var. *implexa* Fr. – This taxon is now treated as *Bryoria implexa* (Fr.) Brodo & D. Hawksw., however the report by Britton (1889: 359) based on collections made by Austin in Bergen County and Eckfeldt in Camden and Atlantic Counties likely refers to *B. trichodes* subsp. *trichodes*. Two specimens collected by C.F. Austin at Budd Lake (NY-01077623, NY-1608284) belong to *B. trichodes*. A search of CNALH did not reveal any Eckfeldt herbarium specimens under this name from New Jersey.

Alectoria ochroleuca var. *sarmentosa* (Ach.) Nyl. – This taxon is now treated as *Alectoria sarmentosa* Ach. (Brodo & Hawksworth 1977) and its range is not considered to include New Jersey (l.c.). The report by Britton (1889: 359) was based on an Eckfeldt collection from Sussex County and it is unclear what taxon this represents as a search of CNALH did not reveal any Eckfeldt herbarium specimens under this name from New Jersey.

Arthonia astroidea Ach. – This species was reported by Britton (1889: 379) based on collections from Bergen made by Austin, as well as Atco and Camden by Eckfeldt. The name is now treated as a synonym of *A. radiata* (Pers.) Ach. (Esslinger 2016), but that species is not known to occur in New Jersey (Lendemer, unpublished data). One specimen collected by Austin and identified as *A. astroidea* with a question mark (NY-506674) is referable to *A. pyrrhuliza*. Another specimen collected by Austin (NY-1608451) represents a different species of *Arthonia*, unfortunately it could not be completely identified because the specimen lacked ascospores.

Arthonia astroidea var. *swartziana* (Ach.) Sacc. – This taxon was reported by Britton (1889: 379) based on material collected by Eckfeldt in Warren. It is now treated as a synonym of *A. radiata* (Esslinger 2016), but that species is not known to occur in New Jersey (Lendemer, unpublished data).

Arthonia dispersa Dufour – This species was reported by Britton (1889: 380) based on material collected on *Acer* by Eckfeldt in Camden. We have not located any specimens originally identified as *A. dispersa* and refrain from including it on the checklist until such material can be examined and confirmed.

Arthonia polymorpha Ach. – This species was reported by Britton (1889: 380) based on material collected on *Carya* by Eckfeldt at Newfield. We have not located any specimens originally identified as *A. polymorpha* and refrain from including it on the checklist until such material can be examined and confirmed.

Arthonia pyrrhula Nyl. – This species was reported by Britton (1889: 380) based on material collected on *Castanea* by Eckfeldt at Newfield. We have not located any specimens originally identified as *A. pyrrhula* and refrain from including it on the checklist until such material can be examined and confirmed. The species is now treated as *Coniarthonia pyrrhula* (Nyl.) Grube and although widespread in the southeastern Coastal Plain (e.g., Lendemer et al. 2016b), is not known to occur in New Jersey.

Arthonia stellaris Kremp. – This species was reported by Britton (1889: 380) based on material collected on *Ailanthus* by Eckfeldt at Atco. We have not located any specimens originally identified as *A. stellaris* and refrain from including it on the checklist until such material can be examined and confirmed.

Arthonia taediosa Nyl. – Britton (1889: 380) reported this species from material collected in Newfield, Gloucester County. Although he indicated that it was collected by Eckfeldt,

it is more likely that the material was collected by Ellis and sent to Eckfeldt. The only specimen we examined that was identified as *A. taediosa* was collected by Green at Atco and is referable to *A. susa*. As has been discussed by Lendemer et al. (2013), historical reports of *A. taediosa* should refer to *A. susa* if the specimens were correctly identified.

Bacidia inundata (Fr.) Körb. – This taxon was reported by Moldenke (1935) and is now referred to as *Bacidina inundata* (Fr.) Vězda (*fide* Esslinger 2016). The genus *Bacidina* Vězda is poorly understood in eastern North America and many different species were collectively referred to this taxon historically (see e.g., Ekman 1996) such that the identity of this report cannot be ascertained with certainty as no supporting voucher was located by us.

Baeomyces byssoides (L.) P. Gaertn., G. Mey. & Schreb. – The report of this taxon by Britton (1899) refers to *B. rufus*.

Biatora cupreorosella (Nyl. ex Stizenb.) Tuck. – Britton (1889: 375) reported this species based on material collected by Austin in Sussex County. Esslinger (2016) listed *B. cupreorosella* as a synonym of *Lecania cuprea* (A. Massal.) van den Boom & Coppins and, while it is possible that report corresponds to *L. cuprea*, we have not reviewed the original vouchers. We have also not reviewed any currently identified vouchers of *L. cuprea* from New Jersey.

Biatora exigua (Chaub.) Fr. – This name was cited parenthetically by Britton (1889) when reporting *Lecidea varians*. The records almost certainly all correspond to *Pyrrhospora varians*.

Biatora inundata Fr. – This taxon was reported by Britton (1889: 375) based on material collected at unspecified locations in New Jersey by Austin. Further discussion is presented in this section under *Bacidia inundata*.

Biatora mixta Fr. – This species was reported by Wood (1914) and Britton (1889: 375), the latter based on material collected by Austin in Bergen and Eckfeldt in Camden. Britton (1889) also included a parenthetical reference to *B. tricolor* Mont. While Esslinger (2016) listed *B. mixta* as a synonym of *Cliostomum griffithii* (Sm.) Coppins, it is more likely that the records refer to *Pyrrhospora varians*. Nonetheless the two specimens collected by Austin that we have examined were instead referable to *Lecidea erythrophaea* (NY-1069027) and *Lecania naegelii* (NY-1079076).

Biatora parvifolia (Pers.) Mont. – Britton (1889: 374) reported this species based on material collected by Austin in Bergen and Eckfeldt in Salem. The species is now treated as *Phyllopsora parvifolia* (Pers.) Müll. Arg. (Brako 1991, Timdal 2011), however it is not known to occur as far north along the Atlantic Coast as New Jersey (Lendemer, unpublished data). We examined a specimen identified as *B. parvifolia* collected by Austin (NY-1077324) and it was referable to *P. corallina*.

Biatora rubella (Hoffm.) Rabenh. – This taxon is now treated as *Bacidia rubella* (Hoffm.) A. Massal., however its range is not considered to include New Jersey (Ekman 1996). It was reported from New Jersey by Britton (1889: 375) and Wood (1914), however all relevant material at NY either belongs to *Bacidia schweinitzii* or *B. suffusa*.

Biatora russellii Tuck. – This species was reported by Britton (1889) based on terricolous material collected by Austin in Bergen. While one would normally assume that the record corresponds to *Psora pseudorussellii*, that species occurs on calcareous rocks and not soil. We have not located the original specimen that served as the basis of this report and thus cannot state with certainty what species it represents.

Biatora sanguineoatra (Wulfen) Tuck. – Britton (1889: 375) reported this species based

- on material collected by Austin. It is currently recognized as a distinct member of *Bryobilimbia* (Fryday et al. 2014) but the vouchers collected by Austin that we have examined (NY-1079343, NY-1608420) were instead referable to *Bilimbia sabuletorum*.
- Buellia colludens* Arnold – Britton (1889: 377) reported this species based on material collected in Salem by Eckfeldt and included a parenthetical reference to “*Lecidea myrini* Fr.” Although *B. colludens* is now treated as a synonym of *Rhizocarpon hochstetteri* (Körb.) Vain. (Fryday 2002), that is a saxicolous species and the report by Britton (1889) was based on corticolous material. Given this it is unclear what species the report would have referred to.
- Buellia lactea* (A. Massal.) Körb. – This species was reported by Wood (1914), however we have not reviewed any vouchers originally assigned to this taxon.
- Buellia parasema* De Not. – Britton (1889: 377) reported this species and stated that it was “on various trunks throughout the state.” Although records are generally treated as referring to *Hafellia disciformis* (Fr.) Marbach & H. Mayrhofer (Esslinger 2016), the name was historically used for many different corticolous *Buellia* species in eastern North America. All of the specimens from New Jersey originally assigned to *B. parasema* that we have examined belong to *B. stillingiana* (NY-1077446, NY-1077447, NY-1077448, NY-1077449, NY-1077450, NY-1077451).
- Buellia petraea* var. *montagnei* Tuck. – The taxon was reported by Britton (1889: 377) under the names based on material collected by Austin in Warren and Bergen. Although it is likely that the specimens originally identified as this taxon are referable to *Rhizocarpon grande* (see entry for *R. petraeum* below), we have not located any material at NY that was originally identified as *B. petraea* var. *montagnei*.
- Buellia schaereri* De Not. – Britton (1889: 377) reported this species based on material collected by Austin in Bergen and by Eckfeldt in Warren, however the specimens assigned to *B. schaereri* that we examined (NY-1077972, NY-1608445) were referable to *Amandinea punctata*.
- Caloplaca cinnabarina* (Ach.) Zahlbr. – Hastings (1940) reported this species, however in its current sense *C. cinnabarina* is not considered to occur in New Jersey (Wetmore & Kärnefelt 1999). Two specimens from New Jersey (NY-1069511, NY-1069512) originally identified as *C. cinnabarina* instead belong to *C. subsoluta*.
- Caloplaca citrina* (Hoffm.) Th. Fr. – This species was reported from New Jersey by Lendemer (2004, 2006), however the material is not conspecific with *C. citrina* and instead belongs to one of the members of this group with sorediate areoles (e.g., Arup 2006). We have opted to refer all such material to *C. flavocitrina* here pending further study of this group in North America.
- Candelariella reflexa* (Nyl.) Lettau – This species was reported by Lendemer (2004, 2006), however the records refer to *C. xanthostigmoides* (see Lendemer & Westberg 2010).
- Cetraria fahlunensis* (L.) Schaer. – Britton (1889: 358) reported this species based on material collected by Austin in the Delaware Water Gap. While *C. fahluensis* is now treated as *Cetrariella commixta* (Nyl.) A. Thell & Kärnefelt (*fide* Esslinger 2016), we reexamined the specimen collected by Austin and found it to represent *Melanelia culbersonii*.
- Cetraria islandica* (L.) Ach. – This species was reported by Britton (1889: 358) based on collections from Delaware Water Gap made by Austin. It was also reported by Torrey (1937). All of the specimens originally identified as *C. islandica* at NY have proven to be *C. arenaria*, including two specimens collected by Austin at the Delaware Water Gap (NY-1068268, NY-1077626).

- Cetraria juniperina* (L.) Ach. – Reports of this species by Britton (1889) and Little (1951) refer to *Vulpicida viridis*.
- Cetraria lacunosa* Ach. – Reports of this species by Britton (1889), Little (1951) and Torrey (1933a) refer to *Platismatia tuckermanii*.
- Chrysothrix flavovirens* Tønsberg – The report of this species by Lendemer (2006) refers to *Chrysothrix chamaecyparicola*.
- Cladonia alpestris* (L.) Rabenh. – This species was reported by Sedia & Ehrenfeld (2003, 2005, 2006) and is presently considered to be conspecific with *C. stellaris* (Opiz) Pouzar & Vězda. Nonetheless *C. stellaris* is not known to occur in New Jersey. No correctly identified vouchers were seen for this study (although New Jersey was included in the range map published by Brodo et al. (2001)) and the reports could refer to either *C. arbuscula* or *C. subtenuis*.
- “*Cladonia bacillaris* f. *peritheta* (Wallr.) Arn.” – This name was used by Evans (1940) and almost certainly refers to *C. macilenta* var. *bacillaris*.
- Cladonia calycantha* Nyl. – This species was reported by several authors (Evans 1935, 1938, 1940; Forman 1998, Little 1951) and these reports almost certainly all correspond to *C. rappii*.
- Cladonia calycantha* f. *foliosa* Vain. – This taxon was reported by Evans (1938, 1940) as well as Little (1951). The records are likely *C. rappii*.
- Cladonia caroliniana* Tuck. – This species was reported by many authors (Evans 1935, Forman 1998, Hastings 1940, Moldenke 1935, Niering 1953, Olsson 1998). The specimens we examined were mostly referable to *C. dimorphoclada* (e.g., NY-973753, NY-973757, NY-973759, NY-973760, NY-973767, NY-973992), while others represented *C. uncialis* (e.g., NY-1069074, NY-1069075, NY-1069076, NY-1069077).
- Cladonia caroliniana* f. *dilatata* A. Evans – This infraspecific taxon was reported by Evans (1935, 1938, 1940) and Moldenke (1935). The specimens we examined were referable to a mix of *C. dimorphoclada* (e.g., NY-973754, NY-973763) and *C. uncialis* (e.g., NY-1069078, NY-1069079, NY-1069080, NY-1069081, NY-1069082).
- Cladonia caroliniana* f. *fibrillosa* A. Evans – This infraspecific taxon was reported by Evans (1935) and the record almost certainly refers to *C. dimorphoclada*.
- Cladonia caroliniana* f. *prolifera* A. Evans – This infraspecific taxon was reported by Evans (1940) and the record almost certainly refers to *C. dimorphoclada*.
- Cladonia caroliniana* f. *tenuiramea* A. Evans – This infraspecific taxon was reported by Evans (1935, 1938, 1940) and the specimens we examined (e.g., NY-973752, NY-973755, NY-973756, NY-973758, NY-973762, NY-973765) were all referable to *C. dimorphoclada*.
- Cladonia clavulifera* Vain. – This species was reported by several authors (Evans 1935, 1940; Moldenke 1940; Forman 1998), however the reports almost certainly refer to various members of the *C. subcariosa* group such as *C. polycarpoides* and *C. sobolescens*.
- Cladonia clavulifera* f. *nudicaulis* A. Evans – This infraspecific taxon was reported by Evans (1935, 1938, 1940) and Moldenke (1940). The specimens identified under this name at NY that we examined were referable to either *C. polycarpoides* (NY-1077389) or *C. sobolescens* (NY-1068934, NY-1068935, NY-1068936).
- Cladonia clavulifera* f. *pleurocarpa* Robbins – This infraspecific taxon was reported by Evans (1938, 1940), however the records almost certainly refer to *C. sobolescens*.
- Cladonia clavulifera* f. *subfastigiata* Robbins – This infraspecific taxon was reported by Evans (1935), however the record almost certainly refers to *C. sobolescens*.

- Cladonia clavulifera* f. *subvestita* Robbins – This infraspecific taxon was reported by Evans (1935, 1938, 1940), however the records almost certainly refer to *C. sobolescens*.
- Cladonia coccifera* (L.) Willd. – This taxon was reported by Rosentreter & Belnap (2001), however *C. coccifera* is a primarily northern species and no vouchers from New Jersey were seen as part of this study.
- Cladonia cornucopioides* (L.) Hoffm. – This species was reported by several early authors (Britton 1889, Wood 1913, Moldenke 1939). While it is presently treated as a synonym of *C. coccifera* (L.) Willd., that species does not occur in New Jersey (Brodo et al. 2001) and the specimens identified as *C. cornucopioides* at NY (e.g., NY-1608412, NY-1077354, NY-1077355, NY-1077356, NY-1077357) were referable to *C. pleurota*.
- Cladonia cornuta* (L.) Hoffm. – This species was reported by Britton (1889: 372) based on terricolous collections made by Austin in Bergen and Eckfeldt in Warren. We have not reviewed any specimens originally identified as *C. cornuta* from New Jersey and we exclude it from the checklist as it has a northern distribution in North America (Brodo et al. 2001) and the original reports almost certainly referred to other sorediate taxa such as *C. ochrochlora* and *C. rei*.
- Cladonia deformis* (L.) Hoffm. – This taxon was reported by Rosentreter & Belnap (2001), however *C. deformis* is a primarily northern species and no vouchers from New Jersey were seen as part of this study.
- Cladonia degenerans* (Flörke) Spreng. – Britton (1889: 372) reported this species based on terricolous material collected by Austin in Bergen and by Eckfeldt in Sussex and Warren. Surprisingly, we were unable to locate any material at NY that was originally named *C. degenerans*, and this included amongst the material filed as *C. phyllophora* and *C. verticillata*. Thus it is unclear what species the report refers to.
- Cladonia diversa* Asperges – Lendemer (2006) reported this species, however the vouchers represent *C. pleurota*.
- Cladonia fimbriata* (L.) Fr. – This species was reported from New Jersey by multiple authors (Britton 1889; Bard 1952; Evans 1935, 1938, 1940; Woods 1914), however all of the historical specimens we examined at NY have proven to represent other taxa with simple podetia that can form shallow cups (e.g., *C. ochrochlora* and *C. rei*). The reports by Evans may be accurate, however we have not reviewed the vouchers upon which they were based and prefer to exclude the species from the checklist at present.
- Cladonia fimbriata* var. *tubaeformis* (Hoffm.) Fr. – Britton (1889: 372) reported this species based on material collected by Austin in Bergen and also included a parenthetical reference to *C. fimbriata* var. *adpersa* F. Wilson. As was the case for *C. fimbriata* itself, the specimens collected by Austin that we examined at NY and identified as *C. fimbriata* var. *adpersa* were *C. ochrochlora* (NY-1068995) or *C. rei* (NY-1068998).
- Cladonia gracilis* (L.) Willd. – This taxon was report by Britton (1889: 372) based on material collected by Austin in Bergen and by Eckfeldt at Atco in Camden County. It was also reported by Evans (1940). Specimens originally identified as *C. gracilis* and collected by Austin are referable to a mixture of different species including *C. peziziformis* (NY-1069139), *C. phyllophora* (NY-01817856), *C. rei* (NY-1068993, NY-1068997), and *C. verticillata* (NY-1068518). Likewise, a collection made by Green at Atco (NY-952514), likely at the time as Eckfeldt would have visited the site, was referable to *C. atlantica*.
- Cladonia gracilis* var. *dilatata* (Hoffm.) Vain. f. “squamulosa (Schaer.) Sandst.” – This taxon was reported by Evans (1940), however we have not reviewed any material assigned to this taxon and it almost certainly refers to a species of *Cladonia* other than *C. gracilis*.

- Cladonia gracilis* var. *elongata* (Wulfen) Flörke – This taxon was reported by Britton (1889: 372) based on material collected by Austin in Bergen and on “small forms” collected by Eckfeldt in Sussex. We have not reviewed any material assigned to this taxon and it almost certainly refers to a species of *Cladonia* other than *C. gracilis*.
- Cladonia gracilis* f. *hybrida* Schaer. – Britton (1889: 372) listed this taxon as “var. hybrida” and based the report on material collected by Austin in Bergen and by Eckfeldt in Salem. We have not reviewed any material assigned to this taxon and it almost certainly refers to a species of *Cladonia* other than *C. gracilis*.
- Cladonia implexa* Harm. – This species was reported by Evans (1938, 1940) and North American records are treated as referring to *Cladonia portentosa* (Dufour) Coem. (Esslinger 2016). Nonetheless *C. portentosa* does not occur in the region (Brodo et al. 2001) and it is unclear what species exactly the reports of *C. implexa* would refer to.
- Cladonia implexa* “f. *subpellucida* Harm.” – Evans (1938) reported this taxon from New Jersey, however we have not reviewed any material assigned to this name and it almost certainly refers to another species of *Cladonia*.
- Cladonia lepidota* Nyl. – This species was reported by Britton (1889: 373) based on collections made by Austin in Bergen and Eckfeldt in Salem. We examined three specimens collected by Austin (NY-1608402, NY-1069144, NY-1069145) and all proved to represent *C. piedmontensis*.
- Cladonia mitis* Sandst. – This taxon was reported from New Jersey several times (Evans 1935, 1938, 1940; Moldenke 1939; Sedia & Ehrenfeld 2003, 2005, 2006). However while its range was mapped as including New Jersey by Brodo et al. (2001), all of the specimens we have examined that were originally identified as *C. mitis* have instead proven to represent *C. submitis*. Therefore we exclude *C. mitis* from the checklist until a correctly identified voucher can be located.
- Cladonia mitis* f. *divaricata* Sandst. – This infraspecific taxon was reported by Evans (1935). However as is the case for *C. mitis* itself, the record almost certainly belongs to *C. submitis*.
- Cladonia mitis* f. *prolifera* Sandst. – This infraspecific taxon was reported by several times (Moldenke 1939; Evans 1935, 1938, 1940). However as is the case for *C. mitis* itself, the records almost certainly belong to *C. submitis*.
- Cladonia nanodes* Robbins nom. inval. – This name does not appear to have been validly published, but was listed for New Jersey by Evans (1940). The only collection we examined that was originally assigned to this name (Atlantic Co., Port Republic, 1936, R.H. Torrey s.n. (NY-1077126)) represents *C. strepsilis*.
- “*Cladonia papillaria* f. *prolifera* (Wallr.) Schaer.” – This name was used by Evans (1940) and almost certainly refers to *Pycnothelia papillaria*.
- “*Cladonia rangiferina* var. *sylvatica* (L.) Fr.” – Britton (1889) used this name, however the reports could easily refer to any of several species that occur in New Jersey, including *C. arbuscula*, *C. rangiferina* or *C. subtenuis*.
- Cladonia scabriuscula* (Del.) Leight. – This taxon was reported by Evans (1938, 1940), however we have not located any specimens referable to the species. We have excluded it from the checklist pending examination of the original specimens.
- Cladonia stellaris* (Opiz) Pouzar & Vězda – This taxon was reported by Rosentreter & Belnap (2001), however *C. stellaris* is a primarily northern species and no vouchers from New Jersey were seen as part of this study (see also the entry for *C. alpestris* in this section).

- Cladonia subcariosa* Nyl. – This species was reported from New Jersey by Bard (1952), Evans (1935, 1938, 1940) and Moldenke (1935). Although it is a rare species that occurs in the Mid-Atlantic region, all specimens we have examined from New Jersey proved to represent *C. polycarpoides*, which differs in the absence of atranorin.
- Cladonia subcariosa* var. *evoluta* Vain. – This infraspecific taxon was reported by multiple authors (Bard 1952; Evans 1935, 1938, 1940; Hastings 1940; Moldenke 1935), however all specimens examined for this study proved to represent *C. polycarpoides* rather than *C. subcariosa*.
- Cladonia subcariosa* f. *pleurocarpa* Robbins – This infraspecific taxon was reported by Evans (1940), however all specimens examined for this study proved to represent *C. polycarpoides* rather than *C. subcariosa*.
- Cladonia subcariosa* f. *squamulosa* Robbins – This infraspecific taxon was reported by multiple authors (Bard 1952; Evans 1938, 1940; Moldenke 1935), however all specimens examined for this study proved to represent *C. polycarpoides* rather than *C. subcariosa*.
- Cladonia sylvatica* (L.) Hoffm. – This species was reported by many authors (Evans 1935, 1938, 1940; Forman 1998, Hastings 1940, Moldenke 1935, Torrey 1937) and the records likely correspond to both *C. arbuscula* and *C. subtenuis*.
- Cladonia sylvatica* f. *decumbens* Anders – This taxon was reported by Evans (1935) and could refer to *C. arbuscula* or *C. subtenuis*.
- Cladonia sylvatica* f. *prolifera* Sandst. – This taxon was reported by Evans (1940) and could refer to *C. arbuscula* or *C. subtenuis*.
- Cladonia sylvatica* f. *pygmaea* Sandst. – This taxon was reported by Evans (1935, 1938) and could refer to *C. arbuscula* or *C. subtenuis*.
- “*Cladonia sylvatica* f. *setigera* Oxner” – This name was used by Evans (1938) and could refer to *C. arbuscula* or *C. subtenuis*.
- Cladonia symphy carpia* (Flörke) Fr. – This species was reported by Britton (1889: 371) from localities throughout New Jersey, however it is not presently considered to occur in the region (Brodo et al. 2001). Historically the name was applied to other members of the *C. subcariosa* group that are known from the area, particularly *C. polycarpoides*, and it is likely that the report by Britton (1889) refers to one of those species. Britton (1889: 372) also reported the infraspecific taxon “*C. symphicarpa* var. *epiphylla* (Ach.) Nyl.” from New Jersey and this almost certainly also refers to one of the other members of the *C. subcariosa* group.
- Cladonia tenuis* (Flörke) Harm. – This species was reported from New Jersey multiple times (Evans 1935, 1938, 1940, Moldenke 1940), however it is not known to occur in New Jersey and the reports almost certainly all refer to *C. subtenuis*.
- Cladonia tenuis* f. *setigera* Abbayes – This infraspecific taxon was reported by Evans (1935, 1938, 1940) and as is the case for *C. tenuis* the records almost certainly refer to *C. subtenuis* instead.
- Cladonia turgida* Ehrh. ex Hoffm. – This species was reported by multiple authors (Britton 1889, Evans 1938, Dix 1942). While it is mapped as occurring in New Jersey by Brodo et al. (2001) we have not located the species in the region and all collections identified as *C. turgida* at NY belong to other species with large primarily squamules such as *C. apodocarpa* and *C. polycarpoides*. We exclude *C. turgida* from the list pending discovery of a correctly named voucher.
- Collema microphyllum* (Sw.) DC. – Britton (1889: 365) reported this species based on material collected by Austin in Bergen “on old trunks”. We have not located any

specimens originally identified as *C. microphyllum* and refrain from including it on the checklist until such material can be examined and confirmed.

Collema pulposum (Bernh.) Ach. – This species was reported by multiple early authors (Britton 1889, Wood 1913, Torrey 1933). While it is presently treated as a synonym of *Enchylium tenax*, the specimens originally assigned to this name belong to different species including both *E. tenax* (NY-475260) and *C. pustulatum* (NY-475246).

Collema verruciforme (Ach.) Nyl. – This taxon was reported by both Britton (1889) and Wood (1914), however we have not reviewed any specimens originally assigned to this name. Further, Esslinger (2016) considered the occurrence of the species in North America to be doubtful, so it seems likely that the reports refer to another species of cyanolichen.

Coniocybe pallida (Pers.) Fr. – Britton (1889: 381) reported this species based on material collected by Eckfeldt at Newfield “on dead wood”. Although North America records of *C. pallida* are now treated as *Sclerophora nivea* (Hoffm.) Tibell, that is a rare corticolous species that one would presume does not occur on “dead wood” (Selva 2014). We have not located any material that was originally identified as *C. pallida*.

Crocynia lanuginosa (Ach.) Hue – This species was reported by Moldenke (1935) and is currently treated as *Lepraria membranacea* (Dickson) Vain., a species that is not considered to occur in New Jersey (Lendemer 2013). The name *C. lanuginosa* was broadly applied historically to nearly all species currently placed in *Lepraria* Ach., however the majority of earlier reports from eastern North America apply to the common and widespread species *L. finkii* which is found throughout New Jersey.

Crocynia membranacea (Dicks.) Zahlbr. – This species was reported by Moldenke (1934a, 1935) and is currently treated as *Lepraria membranacea* (Dickson) Vain., a taxon that is not considered to occur in New Jersey (Lendemer 2013). As is the case for *C. lanuginosa*, the name *C. membranacea* was widely misapplied to a other species of *Lepraria* in the past and most eastern North American reports apply to *L. finkii* rather than *L. membranacea*.

Dermatocarpon aquaticum (Hoffm.) Zahlbr. – This taxon was reported by Moldenke (1934a, 1935) and while the reports likely correspond to *D. luridum* we have not yet examined the source voucher specimens.

Dermatocarpon hepaticum (Ach.) Th. Fr. – This species was reported by Wood (1914) and was also reported earlier under the name *Endocarpon hepaticum*. We examined two specimens at originally assigned to *D. hepaticum* (NY-414353, NY-414350) and found that both correspond to *Placidium squamulosum*.

Dermatocarpon miniatum (L.) W. Mann – This species was reported by several authors (Hastings 1940, Moldenke 1935, Torrey 1933). While it is likely that the records refer to *D. muhlenbergii*, there is a possibility that they correspond to other members of the genus (e.g., *D. arenosaxi*) and thus the original voucher specimens must be located and examined.

Dermatocarpon miniatum var. *complicatum* (Lightf.) Th. Fr. – This species was reported by Wood (1914). While it is likely that the record refers to *D. muhlenbergii*, there is a possibility that they correspond to other members of the genus (e.g., *D. arenosaxi*) and thus the original voucher specimens must be located and examined.

Endocarpon hepaticum Ach. – This species was reported by Britton (1889: 382) based on material collected in Bergen by Austin and in the “Blue Mts.” of Sussex by Eckfeldt. We examined several specimens collected by Austin (NY-414351, NY-414354, NY-414352) and all of these were referable to *Placidium squamulosum*.

- Endocarpon miniatum* (L.) P. Gaertn., G. Mey. & Scherb. – This taxon was reported by Britton (1889) and like the reports of *Dermatocarpon miniatum*, likely refers to *D. muhlenbergii*. Nonetheless, the original voucher specimens must be located and examined.
- Endocarpon miniatum* var. *aquaticum* (Hoffm.) Schaer. – This taxon was reported by Britton (1889) and like the records of *Dermatocarpon aquaticum*, the report likely refers to *D. luridum* but this requires further study.
- Endocarpon miniatum* var. *complicatum* (Lightf.) Schaer. – This taxon was reported by Britton (1889) and like the records of *Dermatocarpon miniatum* var. *complicatum*, the report likely refers to *D. muhlenbergii* but this requires further study.
- Endocarpon pusillum* Hedwig – This species was reported by Lendemer (2004), however the record refers to *E. petrolepideum*.
- Endocarpon rufescens* Ach. – Britton (1889: 382) reported this species based on material collected by Austin in Bergen and by Eckfeldt in Sussex. We examined two specimens collected by Austin and one was referable to *Placidium pilosellum* (NY-414349) and the other (NY-1608466) appears to represent the same species, but is glued to a backing and could not be studied in detail without damaging the material.
- Ephebe pubescens* (L.) Fr. – Britton (1889: 365) reported this species based on material collected by Austin in Bergen and by Eckfeldt in the Blue Mountains of Sussex County. Although the taxon is now recognized as *Pseudephebe pubescens* (L.) M. Choisy, the material collected by Austin (NY-507001, NY-507002, NY-507003, NY-507004, NY-1608336) instead is referable to *E. hispidula* (Ach.) Horw.
- Evernia furfuracea* (L.) W. Mann – This species was reported by Britton (1889: 358) based on material collected by Austin in Bergen on “old trees.” All of the specimens we have examined (NY-1077201, NY-1077202, NY-1077203, NY-1608271, NY-1608272) were referable to *Pseudevernia consocians*.
- Glyphis achariana* Tuck. – Britton (1889: 379) reported this species based on material collected by Eckfeldt in Newfield where it was not considered to be common. Records of *G. achariana* from North America are treated as *G. cicatricosa* Ach. (Esslinger 2016), however we have not reviewed any vouchers originally identified as that taxon and it is not known to occur as far north as New Jersey (Brodo et al. 2001).
- Graphis dendritica* (Ach.) Ach. – This species was reported by Wood (1914) and Britton (1889: 379), the latter based on material collected by Austin in Bergen and by Eckfeldt at Atco in Camden County. The species is currently treated as *Phaeographis dendritica* (Ach.) Müll. Arg. (Staiger 2002), however the specimens we examined (NY-506735, NY-1608448) were instead referable to *G. scripta*.
- Graphis elegans* (Borrer ex Sm.) Ach. – Britton (1889: 379) reported this species based on material collected by Austin in Bergen. Specimens we have examined at NY (NY-506728, NY-506736, NY-1608449) were all referable to *G. scripta*.
- “*Graphis recta*” – This taxon was reported by Thomson (1935), however we have not examined any specimens originally assigned to this name and the report almost certainly refers to one of the forms of *G. scripta*.
- Graphis scalpturata* Ach. – Britton (1889: 379) reported this species based on material collected by Austin in Bergen and by Eckfeldt in Salem. We have not reviewed any vouchers originally identified as *G. scalpturata*, but the reports almost certainly refer to one of the many forms of *G. scripta*.

- Gyalecta lutea* (Dicks.) Tuck. – This species was reported by Britton (1889: 371) based on material collected by Ellis in Newfield. No specimen assigned to this name could be located at NY, and although it is possible that species occurs in New Jersey we prefer to exclude it until a supporting voucher can be located and the identification confirmed.
- Gyalideopsis subaequatoriana* Lücking & W.R. Buck – Lücking et al. (2007) reported this species from New Jersey, however the records belong to *G. bartramiorum*.
- Hafellia disciformis* (Fr.) Marbach & H. Mayrh. – Lendemer (2004) reported this species from New Jersey, however the report almost certainly corresponds to *Buellia curtisii*.
- Heppia despreauxii* (Mont.) Tuck. – This taxon was reported by Britton (1889: 364) based on material collected by Eckfeldt in Camden. We have not located the material that was the original basis of the report, but it almost certainly corresponds to *H. adglutinata* A. Massal. (Brodo et al. 2001, Henssen 1994).
- Heterothecium pezizoideum* (Ach.) Stizenb. – Britton (1889: 376) reported this species based on material collected by Austin in Bergen, however we have not located the original material and it is unclear what taxon it corresponds to.
- Heterothecium sanguinarium* (L.) Tuck. – Britton (1889: 376) reported this species based on material collected in southern New Jersey by Eckfeldt and stated that it was “frequent.” This taxon is now referred to as *Mycoblastius sanguinarius* (L.) Norman, however that is a northern species that has not been found in New Jersey. It is unclear what taxon the report of *H. sanguinarium* corresponds to.
- Heterothecium tuberculosum* (Fée) Flot. – Britton (1889: 376) reported this species based on material collected in Atlantic County by Eckfeldt. It is a tropical species that is now treated as *Megalospora tuberculosa* (Fée) Sipman and does not occur in New Jersey (Sipman 1983). The report almost certainly refers to *M. porphyritis* (Harris 1984).
- Heterothecium vulpinum* (Tuck.) Tuck. – This taxon was reported by Britton (1889: 376) based on a single collection made by Green on dead wood in Atlantic County. Although we have not located this specimen, the report almost certainly refers to *Brigantiaea leucoxantha*. Also refer to the entry for *Lopadium vulpinum* in this section.
- Lecanora athroocarpa* Duby – Britton (1889: 369) reported this species based on corticolous material collected by Austin in Bergen and by Eckfeldt in Camden. We have not reviewed any material originally assigned to this name and it is not presently included on the North American checklist (Esslinger 2016). The report almost certainly corresponds to another species of *Lecanora*.
- Lecanora bockii* T. Rödig – This species was reported by Britton (1889) and Wood (1914). It is currently treated as a synonym of *Rimularia gibbosa* (Ach.) Coppins, Hertel & Rambold (Esslinger 2016), however we have not reviewed any vouchers of this taxon from New Jersey. It is possible that the reports refer to *R. badioatra*, a species that we report here from New Jersey.
- Lecanora cervina* Ach. – This species was reported by Britton (1889: 369) based on material collected by Austin in Bergen. It is now typically treated as a form of *Acarospora glaucocarpa* (Ach.) Körb., however that species does not occur in New Jersey. We have not located Austin’s material of *L. cervina* and thus cannot state what modern species it corresponds to.
- Lecanora elatina* Ach. – Britton (1889: 369) reported this species based on material collected in Camden by Eckfeldt. The species is now treated as *Loxospora elatina* (Ach.) A. Massal, a soorediate species with a northern distribution in North America (Brodo et al. 2001).

While the occurrence of this species in New Jersey is possible, we have not reviewed any specimens originally assigned to this name and it would be unlikely to have occurred so far south in the region. The report could refer to any number of soresiate or pustulose taxa including *Lecanora thysanophora* and *Lepra pustulata*.

Lecanora fuscata var. *rufescens* (Ach.) Tuck. – Britton (1889: 369) reported this taxon based on material from “northern New Jersey” collected by Eckfeldt. Although it is now recognized as a distinct species (Westberg et al. 2011), we have not reviewed any material of it from New Jersey.

Lecanora gibbosa (Ach.) Nyl. – This taxon was reported by Moldenke (1935) and is now treated as *Circinaria gibbosa* (Ach.) A. Nordin, Savi & Tibell (Nordin et al. 2010). While we have been unable to locate Moldenke’s vouchers, specimens named *L. gibbosa* from New Jersey instead belong to other species of *Aspicilia*, such as *A. cinerea* (NY-1069558) and *A. laevata* (NY-1069567).

Lecanora miculata Ach. – This species was reported by Britton (1889) and Nearing (1940). While it is currently recognized as a distinct species (Brodo 1984) we have not reviewed any vouchers of the taxon from New Jersey.

Lecanora orosthea (Ach.) Ach. – This species was reported by Britton (1889: 369) based on collections made by Austin in Bergen and Eckfeldt in Camden. Although the species is still recognized as distinct, it is a saxicolous soresiate taxon with usnic acid (Zdu czyk & Kukwa 2014) that does not occur in New Jersey. The records almost certainly refer to *Lecanora strobilina*, as was the case for the one specimen we examined at NY (NY-1079215).

Lecanora pallescens (L.) Röhl. – This species was reported by Britton (1889: 369) based on collections made by Austin in Bergen and Eckfeldt in unspecified areas of the region. It was also reported by Wood (1914). Although this taxon is now recognized as *Ochrolechia pallescens* (L.) A. Massal. (Kukwa 2011), the name was widely misapplied to nearly all eastern North American species of *Ochrolechia* A. Massal. in the past and specimens identified as *L. pallescens* could represent any of the members of the genus that occur in New Jersey.

Lecanora pallida (Schreb.) Rabenh. – This species was reported by Britton (1889) and Wood (1914). While it is still recognized as a distinct taxon (Imshaug & Brodo 1966), the name was widely applied historically to virtually all corticolous species with *Lecanora* with densely pruinose apothecia discs. The specimens examined from New Jersey that were originally referred to *L. pallida* have all proven to represent *L. subpallens*.

Lecanora pallida var. *cancriformis* Tuck. – This taxon was reported by Britton (1889) and as is the case for *L. pallida*, almost certainly corresponds to *L. subpallens*.

Lecanora punicea (Sw.) Ach. – Britton (1889: 369) reported this species based on material collected by Eckfeldt in Salem. We have not reviewed any material that was originally assigned to this name, however it was historically applied to many different species of *Haematomma* and no member of that genus is known to occur as far north as New Jersey (Brodo et al. 2008).

Lecanora rubina (Hoffm.) Ach. – This species was reported by Britton (1889: 368) based on material collected by Austin in Sussex and by Eckfeldt in Warren. Reports from North America are generally considered to refer to *Rhizoplaca chrysoleuca* (Ach.) Zopf (Esslinger 2016), however that species does not occur in New Jersey. Although we have not reviewed any vouchers identified as this taxon, it is very likely that the reports refer to *Rhizoplaca subdiscrepans*.

- Lecanora subfusca* (L.) Ach. – Britton (1889: 368) reported this species based on unspecified material and stated that it was “on trunks and rocks; frequent.” The species was also reported by Hastings (1940). The reports must refer to any number of members of the *L. subfusca* group that occur in North America as the name was widely applied to many different species in the past (see e.g., Brodo 1984).
- Lecanora subfusca* var. *allophana* Ach. – Britton (1889: 368) reported this species based on corticolous material collected by Eckfeldt in Camden. Although it is now recognized as a distinct species, *L. allophana* (Ach.) Nyl. (Brodo 1984), that species is not presently known to occur in New Jersey. Given the location and substrate of the material collected by Eckfeldt it seems likely that it corresponds to the common *L. hybocarpa*.
- Lecanora subfusca* var. *distans* (Pers.) D. Dietr. – This taxon was reported by Britton (1889: 368) based on material collected on Chestnut bark at Atco by Eckfeldt. Although now treated as a synonym of *Lecanora populicola* (DC.) Duby (Esslinger 2016), that species does not occur in New Jersey and the report almost certainly corresponds to another species such as *L. hybocarpa*.
- Lecanora tartarea* (L.) Ach. – Britton (1889) and Wood (1914) both reported this species, which is now recognized as *Ochrolechia tartarea* (L.) A. Massal. (Kukwa 2011). The material cited by Britton (1889: 369) is saxicolous and thus the report corresponds to *O. yasudae*, which is the most common and widespread saxicolous species in eastern North America.
- Lecanora varia* (Hoffm.) Ach. – This species was reported by multiple authors (Britton 1889, Wood 1914, Moldenke 1935), however the name was historically widely applied to different species with usnic acid, particularly *L. strobilina* in eastern North America. As has been outlined by Printzen (2001), the occurrence of *L. varia* in North America is highly doubtful, and thus we exclude it here from the New Jersey checklist.
- Lecanora varia* var. *sepincola* (Ach.) Link – This taxon was reported by Britton (1889) and Wood (1914) and the reports almost certainly correspond to *L. strobilina* or *L. cupressi*.
- Lecanora xanthophana* Nyl. – This taxon was reported by Britton (1889: 369) based on saxicolous material from northern New Jersey and was also reported by Wood (1914). The name was widely misapplied historically to many different species of *Acarospora* with yellow thalli (Knudsen & Flakus 2016) and the records from New Jersey refer to *A. tuckerae* (Lendemer 2010).
- Lecidea enteroleuca* Ach. – Britton (1889: 376) reported this species back on material collected by Austin in Bergen and by Eckfeldt in Camden, the latter from both corticolous and saxicolous substrates. Britton (1889) also included a parenthetical reference of *L. elaeochroma* (Ach.) Ach. Given the parenthetical reference and the fact that the original report was based on material from very different substrates, it is almost certain that the report referred to more than one *Lecidella* species as presently delimited.
- Lecidea lapicida* (Ach.) Ach. – This species was reported by Moldenke (1935) and we have not located any material originally assigned to the name. Its occurrence in New Jersey is highly unlikely as the report almost certainly refers to another saxicolous crustose lichen with a white thallus and black, lecideine apothecia.
- Lecidea parasema* (Ach.) Ach. – This species was reported by Hastings (1940) and while we have not located the material that served as the basis of the report, it almost certainly corresponds to another crustose lichen, potentially a species of *Lecidella*.
- Lecidea russellii* Tuck. – This species was reported by Torrey (1933), and while it likely corresponds to *Psora pseudorussellii*, the original vouchers should be verified.

- Lecidea solediza* Nyl. – Moldenke (1935) reported this species from New Jersey and while we have not located the material that served as the basis of the report, it almost certainly corresponds to another solediate crustose lichen.
- Lepraria incana* (L.) Ach. – This taxon was reported by Lendemer (2004) and later by Lendemer (2006) as *L. aff. incana*. The New Jersey records belong to *L. hodkinsoniana* (Lendemer 2013).
- Lepraria lobificans* Nyl. – This taxon was reported by Lendemer (2004, 2006) and these records refer to *L. finkii* (Lendemer 2013).
- “*Lepthorapsis derinidis* (Ach.) Th. Fr.” – Wood (1914) reported this species, however it is unclear what taxon it actually refers to.
- Leptogium bolacinum* (Ach.) Nyl. – Britton (1889: 366) reported this species based on material collected by Austin in Bergen “on rocks among mosses.” We have not located the material that served as the basis of the original report and it is unclear what species this would correspond to at present. The name is not included on the North American checklist (Esslinger 2016).
- Leptogium lacerum* (Sw.) Gray. – This species was reported by Britton (1889) and Wood (1914). Following Esslinger (2016) the records almost certainly refer to *Scytinium lichenoides*.
- Leptogium myochroum* (Ehrh.) Nyl. – Britton (1889: 366) reported this species based on material collected by Austin in Bergen and Eckfeldt in the Blue Mountains of Sussex County. The reports almost certainly refer to *L. hirsutum*.
- Leptogium myochroum* “var. *saturninum* (Sm.) Schaer.” – This name was reported by Britton (1889: 366) based on material collected by Austin in Bergen and Eckfeldt in Camden. The report almost certainly refers to *L. hirsutum*.
- Leptogium pulchellum* (Ach.) Nyl. – Britton (1889: 366) reported this species based on material collected in Bergen by Austin and “on old trunks in the forests of Central New Jersey” by Eckfeldt. Although it is currently recognized as *Collema pulchellum* Ach., all of the specimens we have examined were referable to *L. corticola* (NY-475267, NY-1608348, NY-475271, NY-475269, NY-475268, NY-475266, NY-475265).
- Leptogium saturninum* (Dicks.) Nyl. – This species was reported by Moldenke (1935), however it is not known to occur in New Jersey (Stone et al. 2016) and the report almost certainly refers instead to *L. hirsutum*.
- Leptogium tenuissimum* (Hoffm.) Körb. – Britton (1889: 366) reported this species as being common “on old logs, [in the] forests of New Jersey.” Sierk (1964) did not report material from New Jersey and we have not located any material that corresponds to this taxon in its current delimitation.
- Leptogium tremelloides* (Ach.) Gray – This species was reported by Britton (1889) and following Esslinger (2016) the records almost certainly refer to *L. cyanescens*.
- Lopadium vulpinum* (Tuck.) Zahlbr. – This species was reported by Wood (1914) and is now treated as *Letrouitia vulpina* (Tuck.) Hafellner & Bellem. (Hafellner 1981). Nonetheless no specimens identified as this taxon were seen by us as part of this study, and the genus is restricted to tropical areas in North America that are much further south than New Jersey (Brodo et al. 2001, Hafellner 1981).
- Melaspilea angulosa* Nyl. – Britton (1889: 378) reported this species based on collections made by Eckfeldt near Camden on cherry trees. This species is not presently included on the North American Checklist (Esslinger 2016) and we did not review any vouchers

identified as *M. angulosa* as part of this study. As such we exclude it from the checklist here pending further study.

Mycoporum pycnocarpum Nyl. – This species was reported by Britton (1889: 380) based on material collected by Austin in Bergen. The name is now treated as a synonym of *M. compositum* (Ach.) R.C. Harris (Harris 1973). However, the material from New Jersey collected by Austin (NY-414313, N-414314, NY-1608454) is instead referable to *M. pycnocarpoides*.

Myriangium duriaei Mont. & Berk. – This taxon was reported by Britton (1889) and is not included here as it is not a lichen or allied fungus.

Nephroma laevigatum Ach. – Britton (1889: 363) reported this species based on material collected by Austin in Bergen and Eckfeldt at Atco where it was stated to be “frequent.” *Nephroma laevigatum* is largely restricted to northern coastal areas in North America and is not known to occur in New Jersey (Brodo et al. 2001, Wetmore 1960). Further, the specimens we examined at NY (NY-507057, NY-1608324) that had originally been named *N. laevigatum* were both referable to *N. helveticum*.

Nephroma tomentosum (Hoffm.) Flot. – Britton (1889: 363) reported this species based on material collected in Bergen. The name *N. tomentosum* is now treated as a synonym of *N. resupinatum* (L.) Ach., however that species is not known to occur in New Jersey (Brodo et al. 2001, Wetmore 1960) and the specimens we have examined at NY (e.g., NY-507058, NY-1608323) belong to *N. helveticum*.

Ochrolechia parella (L.) A. Massal. – This species was reported by Forman (1998), however the name was widely applied to many different species of *Ochrolechia* in the past and *O. parella* itself is not known to occur in North America (Esslinger 2016).

Pannaria lanuginosa (Ach.) Körb. – This taxon was reported by Britton (1889) and Wood (1914). Refer to the *Crocynia lanuginosa* entry in this section for further details.

Pannaria lurida (Mont.) Nyl. – Wood (1914) reported this species, however all of the specimens we have examined were referable to *P. lurida* subsp. *russellii*.

Pannaria molybdaea (Pers.) Tuck. – This species was reported by Britton (1889: 364) based on material collected by Austin in Bergen and Eckfeldt in Salem. It was also reported by Wood (1914). The name is now treated as a synonym of *Coccocarpia pellita* (Ach.) Müll. Arg. (Arvidsson & Galloway 1979), however that species is not known to occur in New Jersey, and the specimen at NY named *P. molybdaea* is actually *C. erythroxyli*.

Pannaria molybdaea var. “*cronia*” – This name was used by Britton (1889) and the report almost certainly corresponds to *Coccocarpia palmicola*.

Parmelia borreri (Sm.) Turner – Britton (1889: 360) reported this species based on material collected by Austin in Bergen. The species is now treated as *Punctelia borreri* (Sm.) Krog (Krog 1982), and is considered to occur in temperate eastern North America (Brodo et al. 2001). Nonetheless all of the specimens we examined that were originally assigned to *Parmelia borreri* (e.g., NY-1077231, NY-1077232, NY-1077233, NY-1077235) and collected by Austin in northern New Jersey instead belonged to *Punctelia rudecta*.

Parmelia conspersa f. *imbricata* A. Massal. – Moldenke (1934a, 1935) reported this taxon, however we have not located the vouchers that served as the basis of the reports. Nonetheless they likely correspond to *X. viriduloumbrina*.

Parmelia conspurcata (Schaer.) Vain. – This species was reported by Hastings (1940), however we have not reviewed any vouchers that were originally identified under this name. Following Esslinger (2016), records would be referable to *Melanelixia subargentifera*

- (Nyl.) Blanco et al., however that species is not mapped as occurring in New Jersey (Brodo et al. 2001, as *Melanelia subargentifera*).
- Parmelia laevigata* (Sm.) Ach. – This species was reported by Wood (1914) as well as by Britton (1889: 360). The latter report was with an indication of hesitation (“?”) and was based on material collected by Eckfeldt in Ocean and Monmouth Counties. *Parmelia laevigata* is now treated as *Hypotrachyna laevigata* (Sm.) Hale and is not known to occur in New Jersey (Lendemer & Allen 2015). Specimens from New Jersey originally identified as *P. laevigata* at NY are referable to *H. livida* (e.g., NY-1077682, NY-1608298) and it is likely that the historical reports of *P. laevigata* also refer to that species.
- Parmelia olivacea* (L.) Ach. – This species was reported by multiple authors (Britton 1889, Hastings 1940, Wood 1914) and Britton (1889: 361) stated that it was frequent on oaks. Although *P. olivacea* is now treated as *Melanohalea olivacea* (L.) O. Blanco et al. (Blanco et al. 2004), the range of that species is not considered to include New Jersey (Brodo et al. 2001). Also specimens originally identified as *P. olivacea* at NY (NY-1077747, NY-1077746, NY-1608305) all belong to *Melanelixia subaurifera* and thus it is likely that the historical reports of *P. olivacea* also refer to that species.
- Parmelia perlata* (Huds.) Ach. – This species was reported by Britton (1889) and Wood (1913) and is currently treated as *Parmotrema perlatum* (Huds.) M. Choisy (Hawksworth 2004). Although it is included in the checklist based on a recently collected specimen, all historical specimens originally named *Parmelia perlata* that we have examined (NY-1077632, NY-1077633, NY-1077634) instead belong to *Cetrelia olivetorum*.
- Parmelia quercina* (Willd.) Vain. – Moldenke (1935) reported this species from New Jersey, however two specimens originally identified as *P. quercina* (NY-1077693, NY-1077690) from New Jersey both belong to *Hypotrachyna livida*. While *P. quercina* is now treated as *Parmelina quercina* (Willd.) Hale, the distribution of that species was restricted to western North America (Brodo et al. 2001, Culberson 1961) and subsequently was recognized as a distinct taxon under the name *Parmelina coleae* Argüello & A. Crespo (Argüello et al. 2007). The earlier report of *Parmelia quercina* almost certainly refers to *H. livida* or another morphologically similar species such as *Myelochroa galbina*.
- Parmelia saxatilis* (L.) Ach. – This species was reported by multiple authors (Britton 1889, Little 1951, Wood 1914), however the most recent treatment of *Parmelia* s. str. for eastern North America did not map the species as occurring in New Jersey (Hinds 1998). In fact the majority of historical reports of *P. saxatilis* from temperate eastern North America south of New England refer to *P. squarrosa*, another isidiate species that was only described in the 1970’s (Hale 1971). Although it is likely that the reports of *P. saxatilis* from New Jersey refer to *P. squarrosa*, specimens at NY originally identified as *P. saxatilis* also belonged to other taxa such as *Parmelia sulcata* (NY-1069376), *Punctelia rudecta* (NY-1077237) and even *Xanthoparmelia cumberlandia* (NY-1077578).
- Parmelia stygia* (L.) Ach. – Thomson (1943) reported this species from New Jersey, however a specimen (NY-1077739) collected by him and identified as such is actually referable to *Melanelia culbersonii*.
- Parmelia tiliacea* (Hoffm.) Ach. – This species was reported by Britton (1889) and Little (1951), with Britton (1889: 360) noting that it was found on “trunks, in all the forests.” *Parmelia tiliacea* is currently recognized as *Parmelina tiliacea* (Hoffm.) Hale (Hale 1976b, Núñez-Zapata et al. 2015), but nonetheless the species does not occur in North America (Esslinger 2016). Four specimens from New Jersey originally identified as *Parmelia tiliacea* (NY-1077797, NY-1077798, NY-1077799, NY-1608290) all belong to *Myelochroa galbina* and it is likely that the historical reports also refer to that species.

- Peltigera aphthosa* (L.) Willd. – Britton (1889: 363) reported this species based on material collected by Austin in Bergen. A specimen at NY collected by Austin (NY-1608329) and identified as *P. aphthosa* is referable to *P. leucophlebia* (Nyl.) Gyeln., and thus the report almost certainly refers to that species.
- Peltigera canina* (L.) Hoffm. – This species was reported by multiple authors (Britton 1889, Hastings 1940, Wood 1914). While Brodo et al. (2001) mapped the range of the species as including New Jersey, all of the specimens we have examined to date represent other *Peltigera* species (*P. neckeri*, NY-507031; *P. praetextata*, NY-507033, NY-507036, NY-507044, NY-507046, NY-507034, NY-507035, NY-507037, NY-507045; *P. rufescens*, NY-507055).
- Peltigera polydactylon* (Necker) Hoffm. – This species was reported by multiple authors (Britton 1889: 363) based on material collected by Austin in Bergen and Eckfeldt in Sussex. However, all of the specimens we have examined to date represent other *Peltigera* species (*P. elisabethae*, NY-507016; *P. neckeri*, NY-507032, NY-507030; *P. neopolydactyla*, NY-507023; *P. praetextata*, NY-507038; *P. rufescens*, NY-507052, NY-507053, NY-507054).
- Peltigera subcanina* Gyeln. – This taxon was reported by Moldenke (1935) and could correspond to any one of several *Peltigera* species.
- Peltigera venosa* (L.) Hoffm. – Britton (1889: 363) reported this species based on material collected by Austin in Bergen and Eckfeldt in Warren. We have not located the original material that served as the basis of this report and it seems to be out of range for New Jersey (see e.g., Brodo et al. 2001).
- Pertusaria communis* DC. – Multiple authors reported this species from New Jersey (Britton 1889, Thomson 1935, Torrey 1933a, Wood 1914) and Britton (1889: 370) noted that it was “on various trunks and on rocks; frequent.” *Pertusaria communis* is a name that was widely misapplied historically to many different *Pertusaria* species in eastern North America and as such the records could represent any number of taxa as currently delimited.
- “*Pertusaria lavata*” – Moldenke (1934a, 1935) used this name, however we have not located any supporting vouchers and are unsure what taxon the report actually refers to. Perhaps it was a lapsus for *Pertusaria velata*.
- Pertusaria leioplaca* DC. – Britton (1889: 370) reported this species based on material collected by Austin in Bergen and by Eckfeldt in Camden. While the species is still recognized, the name was widely misapplied historically to many different species of *Pertusaria*. This is illustrated by the fact that material assigned to this name by Austin refers to *P. paratuberculifera* (NY-1069269, NY-1069271) and *P. texana* (NY-1069466) while a specimen collected by Green at Atco is referable to *P. subpertusa* (NY-1069462).
- Pertusaria multipuncta* (Turner) Nyl. – Britton (1889: 370) reported this species based on material collected by Austin in Bergen and by Eckfeldt at Atco. Although now recognized as *Lepra multipuncta* (Turner) Hafellner (Hafellner & Türk 2016), this species does not occur in North America (Esslinger 2016) and historical reports could potentially refer to any species now treated in *Lepra*. Two specimens at NY (NY-1069239, NY-1069240) collected by Austin and originally identified as *P. multipuncta* were both referable to *L. amara*.
- Pertusaria trachythallina* Erichsen – This species was reported by Harris (1985), however the supporting vouchers were either *Lepra multipunctoides* (NY-1069467, NY-1069468) or *L. pustulata* (NY-1069469). Although we have not reexamined the report by Lendemer (2006), it was likely also based on a misidentification of one of the aforementioned taxa.

- Pertusaria xanthodes* Müll. Arg. – This species was reported by Lendemer (2004), however all of the specimens that were assigned to *P. xanthodes* from New Jersey are here treated as *P. pustulata*. The difficulties in delimiting *P. pustulata* and *P. xanthodes* were outlined by Dibben (1980) and based on our study it is simplest to refer all the material from the region to a single taxon.
- Phaeophyscia imbricata* (Vain.) Essl. – This species was reported by Kiviat and MacDonald (2002), and reports from North America are now treated as *P. squarrosa*.
- Physcia astroidea* Nyl. – Britton (1889: 361) reported this species based on material collected on *Populus* by Eckfeldt in Atlantic County. We have not reviewed any specimens that were originally identified as this species at NY. While Esslinger (2016) considers records of *P. astroidea* to refer to *P. clementei* (Sm.) Lynge, that species is very rare and not known to occur in New Jersey.
- Physcia caesia* (Hoffm.) Hampe ex Fürnr. – Torrey (1933) reported this species from New Jersey, however we have not reviewed any specimens originally identified as *P. caesia* at NY. The species was not mapped as occurring in New Jersey by Brodo et al. (2001) and thus its occurrence seems unlikely.
- Physcia comosa* Nyl. – Britton (1889: 361) reported this species based on material collected in Ocean County by Austin and Camden by Eckfeldt. He also included a parenthetical reference to *P. speciosa* var. *galactophylla* (Tuck.) Tuck. *Physcia comosa* is now treated as *Heterodermia comosa* (Eschw.) Follmann & Redón, but is a tropical species that does not occur in New Jersey (Mongkolsuk et al. 2015). While we did not locate any specimens originally identified as *P. comosa*, we did locate a specimen (NY-1608307) collected by Austin in the “Pine Barrens” that was referable to *H. echinata*.
- Physcia endococcina* (Körb.) Nyl. – Hastings (1940) reported this species and while it is presently treated as *Phaeophyscia endococcina* (Körb.) Moberg (Esslinger 2016), the report almost certainly refers to the much more common soresiate species *P. rubropulchra*. We have not located correctly identified material of any of the esoresiate species of *Phaeophyscia* that have an orange or red pigmented medulla (e.g., *P. endococcina*, *P. endococcinodes* (Poelt) Essl., *P. erythrocardia* (Tuck.) Essl.).
- Physcia hispida* (Schreb.) Frege – Britton (1889: 361) reported this species based on material collected by Eckfeldt in Bergen. We have not examined the original material, however it could represent any one of several species of *Heterodermia* or *Phaeophyscia*. A specimen identified as *P. stellaris* var. *hispida* (Schreb.) Nyl. and collected by Austin (NY-1608313) is *H. speciosa* while a specimen identified as *P. hispida* and collected by Nearing in Sussex County (NY-1079054) is *Phaeophyscia hirsuta*.
- Physcia lithotea* (Ach.) Nyl. – Torrey (1933) reported this species, however we have not located the original material that served as the basis of the report and it is unclear what taxon it would refer to.
- Physcia obscura* (Ehrh.) Hampe ex Fürnr. – This species was reported by many authors (Britton 1889, Hastings 1940, Moldenke 1935, Torrey 1933, Wood 1914), however the name was widely misapplied to different Physciaceae in the past and it is unclear what taxa the historical reports refer to. This is illustrated by the fact that historical specimens from New Jersey originally assigned to *P. obscura* are now referable to *Hyperphyscia syncolla* (NY-1078745), *Phaeophyscia adiastrum* (NY-1079053), *Phaeophyscia ciliata* (NY-1079057), *Phaeophyscia hirtella* (NY-1079059, NY-1079060) and *Physcia millegrana* (NY-1079316).

- Physcia pulverulenta* (Schreb.) Hampe ex Fürnr. – This species was reported by Britton (1889) and Wood (1914), however the name was widely misapplied to different species of *Physconia* in the past. All of the specimens at NY originally assigned to this name (NY-1079429, NY-1079431, NY-1079432, NY-1079433) represent *Physconia leucoleiptes*. It is likely that the earlier reports refer only to *P. leucoleiptes*, but it is possible that other species were also included.
- Physcia tribacia* (Ach.) Nyl. – This species was reported by multiple authors (Britton 1889, Hastings 1940, Moldenke 1935, Torrey 1933), however the reports almost certainly all refer to *P. millegrana*. Indeed many of the historical specimens of *P. millegrana* at NY were originally assigned to *P. tribacia* or *P. stellaris* var. *tribacia* (Ach.) Tuck. (e.g., NY-107910, NY-1079312, NY-1079313, NY-1079314, NY-1079315).
- Physma luridum* (Mont.) Tuck. – This taxon was reported by Britton (1889: 364) based on material collected by Austin at unspecific locations, and by Eckfeldt in Camden County at Atco as well as in Gloucester County at Newfield. The reports refer to *Pannaria lurida* subsp. *russellii*, and readers should refer to the entry for *P. lurida* in the present section.
- Placodium aurantiacum* (Lightf.) Anzi – Britton (1889: 367) reported this species from unspecified locations, stating that it was “on rocks and cedars; common.” Considering that the report was derived from material collected from both corticolous and saxicolous substrates, it is likely that it included multiple species of *Caloplaca s.l.* as presently delimited.
- Placodium cinnabarinum* (Ach.) Nyl. – This taxon was reported by Britton (1889) based on material collected by Austin in Bergen on calcareous rocks, and by Eckfeldt in Warren. Refer to the entry in this section for *Caloplaca cinnabarina*.
- Placodium citrinum* (Hoffm.) Hepp – This taxon was reported by Britton (1889: 367) as common on old building and mortar based on collections made by Eckfeldt. It is now treated as *Caloplaca citrina*, however the identity of material assigned to that name from New Jersey remains uncertain (see the entry for *C. citrina* in this section).
- Placodium ferrugineum* (Huds.) Hepp – This species was reported by Britton (1889: 367) based on material collected by Austin in Bergen and Eckfeldt in Camden. We did not review any specimens originally referred to this name, and the one such specimen collected by Austin (NY-1608355) is missing from its mounted label.
- Placodium ferrugineum* var. *pollinii* (A. Massal.) Hepp – Britton (1889: 367) reported this taxon based on material collected by Eckfeldt on cedars in Camden. Although it is now treated as *Caloplaca pollinii* (A. Massal.) Jatta, we have refrained from including the species on the checklist until the original material can be examined and confirmed.
- “*Pseudophyscia comosa* (Eschw.) Nyl.” – This taxon was reported by Wood (1914) and readers should refer to the entry for *Physcia comosa* in this section for further information.
- Pyrenula glabrata* (Ach.) A. Massal. – This species was reported by Britton (1889: 383) based on material collected by Austin in Bergen and by Eckfeldt at Newfield, although the latter was likely collected by Ellis and sent to Eckfeldt for determination. One specimen we examined (NY-414397) was referable to *P. pseudobufonia*, however it is likely that the material that served as the basis for the original report was comprised of multiple species as presently defined.
- Pyrenula hyalospora* (Nyl.) Tuck. – Britton (1889: 383) reported this taxon based on material collected by Austin in Bergen and Eckfeldt in Salem. We examined a specimen collected by Austin (NY-1608473), however the specimen was sterile (lacking hymenia and ascospores) and appeared to represent a non-lichenized pyrenocarpous fungus.

Pyrenula lactea (A. Massal.) Tuck. – Britton (1889: 383) reported this taxon based on material collected by Austin in Bergen and by Eckfeldt at Atco in Camden County and Newfield in Gloucester County. We have not located the material that served as the basis of the report and it is unclear what taxon it refers to.

Pyrenula nitida (Weigel) Ach. – Britton (1889: 383) reported this species based on material collected in Bergen by Austin. The majority of specimens originally assigned to this name are actually referable to *P. pseudobufonia*, however at least one (NY0-506654) is *P. punctella*.

Pyrenula pachycheila Tuck. – Britton (1889: 384) reported this species based on material collected by Eckfeldt at Newfield in Gloucester County. We have not examined any specimens originally assigned to this name and it is unclear what taxon it would refer to.

Pyrenula thelena (Ach.) Trevis. – Britton (1889: 384) reported this species based on material collected by Austin in Bergen and by Eckfeldt in Newfield on the bark of cherry trees. The taxon is now referred to as *Mycomicrothelia thelena* (Ach.) D. Hawksw. (Hawksworth 1985) but we did not locate any specimens filed under that name at NY. It is unclear what taxon this report corresponds to.

Pyxine cocoas (Sw.) Nyl. – This species was reported by Britton (1889) and Wood (1914) as occurring in New Jersey. However, *P. cocoas* is a tropical species whose northern distributional limit is quite far south of New Jersey (Brodo et al. 2001). The reports could refer to *P. subcinerea*, however the one specimen identified as *P. cocoas* that we examined was *Phaeophyscia sciastra* (NY-1079287).

Ramalina calicaris (L.) Fr. – Britton (1889: 357) reported this species from unspecified locations, stating that it was “on oaks; common.” Although this species is still listed on the North American checklist (Esslinger 2016), it was widely misapplied in the past in eastern North America to other species of *Ramalina*. It is unclear what taxon the report would have referred to, but many specimens we examined were *R. americana*.

Ramalina calicaris var. *canaliculata* Fr. – This species was reported by Britton (1889: 357) from Closter in Bergen County and by Wood (1914). Reports of this name from North America are considered to apply to *R. calicaris* (Esslinger 2016), however as is outlined in the entry for that name in this section it is unclear what species the reports refer to.

Ramalina calicaris var. *farinacea* (L.) Rabenh. – Britton (1889: 357) reported this taxon based on saxicolous material collected by Austin in Bergen and by Eckfeldt in Warren. Although it is now treated as *R. farinacea* (L.) Ach., and that species occurs in New Jersey, the report refers to both *R. intermedia* (NY-1077803, NY-1077804, NY-1077805) and *R. petrina* (NY-1077807, NY-1077808).

Ramalina calicaris var. *fastigiata* (Pers.) Fr. – This taxon was reported by Britton (1899) and could refer to *R. americana* and/or *R. culbersoniorum*.

Ramalina calicaris var. *fraxinea* (L.) Mont. – Britton (1889: 357) reported this species as being “frequent” occurring “on old fences and trunks.” It was also reported by Torrey (1933) from Wawayanda. This name was widely misapplied historically to various apotheciate and esorediate species of *Ramalina*, and the material we examined correspond to *R. americana* (NY-1077801).

Ramalina rigida Ach. – Britton (1889: 357) reported this species as being common on pines and oaks in the Pine Barrens of southern New Jersey. It was also reported by Wood (1914). We have not located any of the material that served as the basis of this report, but it likely corresponds to a *R. culbersoniorum* and/or *R. americana*.

- Rhizocarpon confervoides* DC. – This species was reported by Moldenke (1935), however no voucher specimens originally identified under the name were located at NY. The name is not presently included on the North American Checklist (Esslinger 2016) as an accepted species, or as a synonym, and thus we exclude it here.
- Rhizocarpon obscuratum* (Ach.) A. Massal. – This species was reported by Moldenke (1935), however no vouchers identified under the name and associated with that study were found at NY. As has been discussed in detail by Fryday (2000), the name *R. obscuratum* has been widely misapplied in the past and in eastern North America most records refer to *R. reductum*. The latter species was reported from New Jersey by Lendemer (2006) and is included in the checklist here.
- Rhizocarpon petraeum* (Wulfen) A. Massal. – This species was reported by Moldenke (1935), however no vouchers identified under the name and associated with that study were found at NY. The species was also reported by Britton (1889: 377) under the names *Buellia petraea* (Wulfen) Branth & Rostr. based on material collected by Britton in northern New Jersey. The specimens collected by Britton that we have examined at NY all refer to *R. grande* (e.g., NY-1077823, NY-1077824). One specimen (NY-1077826) identified as *R. petraeum* and collected by Nearing at Beech Mountain in 1942 is referable to *R. reductum* while another (NY-1077822) collected by Nearing at Charlotteburg in 1937 is referable to *R. grande*.
- Rinodina constans* (Nyl.) Tuck. – This species was reported by Britton (1889: 370) based on collections made by Austin in Bergen and Eckfeldt in Camden. Although the taxon is now treated as *Maronea constans* (Nyl.) Hepp, the vast majority of North American records previously assigned to that species actually refer to *M. polyphaea* (Harris 2006). Based on this, and the fact that four specimens collected by Austin (NY-01069403, NY-01069404, NY-01069405, NY-01608372) belong to *M. polyphaea*, we here exclude *M. constans* from New Jersey.
- Rinodina sophodes* (Ach.) A. Massal. – Britton (1889: 370) reported this species because of collections made by Austin in Bergen and by Eckfeldt in Sussex. Although this taxon is recognized as a distinct species, it was widely misapplied to numerous different *Rinodina* species in the past. This is evidenced by the fact that specimens collected by Austin represent *R. cana* (NY-1079456), *R. maculans* (NY-1079452, NY-1079453) and *R. subminuta* (NY-1079458). The species is here excluded from the New Jersey checklist.
- Rinodina sophodes* var. *confragosa* (Ach.) Tuck. – Britton (1889: 370) reported this species based on collections made by Austin in Bergen and by Eckfeldt in Warren. Two collections made by Austin in New Jersey at NY represent *R. destituta* (NY-1107349) and *R. tephraeaspis* (NY-1079465). An additional collection made by Austin (NY-1068369) was originally named *R. sophodes* var. *confragosa*, however the specimen itself is missing from the collection and its identification could not be confirmed. Although this taxon is now treated as *R. confragosa* (Ach.) Körber (Sheard 2010) and reported from North America (Esslinger 2016), we exclude it from the New Jersey checklist.
- Sagedia lactea* Körb. – Britton (1889: 382) reported this species based on material collected by Austin in Bergen and Eckfeldt in Camden on the branches of hickory. We have not located the material that served as the basis of the report and it is unclear what taxon it refers to.
- Sagedia oxyspora* (Nyl.) Tuck. – Britton (1889: 383) reported this species based on material collected in Bergen by Austin and at Newfield in Gloucester County by Eckfeldt

- (likely actually collected by Ellis and sent to Eckfeldt). It was reported as occurring on “poplar and white birch,” substrates that would support the identity of the material as *Leptorhaphis epidermidis* (Ach.) Th. Fr., which is currently treated as the correct name for *S. oxyspora* (Esslinger 2016). Nonetheless the specimens we examined (NY-1076102, NY-1076103) were actually referable to *Julella fallaciosa*.
- Schismatomma pericleum* (Ach.) Branth & Rostr. – This species was reported by Lendemer (2006) and the identification was subsequently revised to *S. graphidioides*.
- Stereocaulon denudatum* Flörke – Britton (1889: 371) reported this species based on material collected by Austin in Bergen and Eckfeldt in Sussex. It was also reported by Wood (1914). The species is now treated as *S. vesuvianum* Pers. (Esslinger 2016), however it is unclear what species the report refers to.
- Stereocaulon denudatum* var. *pulvinatum* (Rabenh.) Flot. – Moldenke (1935) reported this taxon from New Jersey, however we have not located the original material that served as the basis of the report and it is unclear what species it refers to.
- Stereocaulon paschale* (L.) Hoffm. – Britton (1889: 371) reported this species based on material collected by Austin in Bergen and Eckfeldt in Warren. It was also reported by Wood (1914). The species was not mapped as occurring in New Jersey by Brodo et al. (2001), and several specimens at NY are referable to *S. saxatile* (NY-1077273, NY-1077279, NY-1077280, NY-1077281).
- Sticta amplissima* (Scop.) Rabenh. – This taxon was reported by Britton (1889) and Wood (1914). Although still recognized as a distinct species, eastern North American reports of *S. amplissima* correspond to *Lobaria quercizans*.
- Sticta crocata* (L.) Ach. – Britton (1889: 362) reported this species based on material collected by Austin in Bergen, Eckfeldt in Newfeld (where it was stated to be “frequent”), and Peters at Mays Landing. The taxon is now treated as *Pseudocyphellaria crocata* (L.) Vain., but recent research has shown that eastern North American material comprises multiple taxa (Lücking et al. 2017).
- Teloschistes lychnus* (Ach.) Tuck. – Britton (1889: 360) reported this species based on material collected by Austin in Bergen and by Eckfeldt in Camden. The name is now treated as a synonym of *Polyscauliona candelaria* (L.) Frödén, Arup & Søchting (Esslinger 2016), however that species does not occur in eastern North America (Lindblom 1997). It is unclear what species the report refers to as we have not located the original material.
- Teloschistes polycarpus* (Hoffm.) Tuck. – Britton (1889: 360) reported this species based on material collected by Eckfeldt in Camden. Although it is now treated as *Polyscauliona polycarpa* (Hoffm.) Frödén, Arup & Søchting (Esslinger 2016), that species does not occur in New Jersey (Lindblom 1997). We have not located the material that served as the basis of the original report, but it likely corresponds to *Xanthomendoza hasseana* (Räsänen) Søchting, Kärnefelt & S.Y. Kondr.
- Trypethelium cruentum* Mont. – This species is now treated as *Pyrenula cruenta* (Mont.) Vain. (Harris 1989) and was reported by Britton (1889: 382) based on material collected by Eckfeldt in Salem. It was also reported by Wood (1914). No specimens from New Jersey that were originally identified as this taxon were located at NY or PH. While its occurrence in the region is possible given the number of subtropical species with northern range limits in southern New Jersey, the absence of vouchers and the fact it has not been subsequently collected lead us to exclude it until a voucher can be located and its identity confirmed.

- Umbilicaria pustulata* (L.) Hoffm. – This taxon was reported by Britton (1889) and Wood (1914). Although still recognized as a distinct European species, North American reports correspond to other taxa and most reports from the eastern United States are *Lasallia papulosa*.
- Usnea barbata* (L.) F.H. Wigg. – This taxon was reported by Britton (1889) and Wood (1914), however the records could represent any number of *Usnea* species as *U. barbata* was historically applied to many different taxa in North America (Esslinger 2016).
- Usnea barbata* var. *florida* (L.) Fr. – This taxon was reported by Britton (1889), however the species does not occur in New Jersey and the records could refer to either *U. endochrysea* or *U. strigosa*.
- Usnea barbata* var. *dasopoga* (Ach.) Ach. – This taxon was reported by Wood (1914), and while it is currently recognized as *U. dasopoga* Ach., that species is not known to occur in New Jersey and the records could represent any number of *Usnea* species.
- Usnea barbata* var. *hirta* (L.) Fr. – This taxon was reported by Britton (1889: 359) as being common in “Pine woods.” While it is now recognized as *U. hirta* (L.) F.H. Wigg., the species is not known to occur in New Jersey and the historical reports could refer to multiple short shrubby species including *U. mutabilis*.
- Usnea barbata* var. *plicata* (L.) Fr. – This taxon was reported by Britton (1889: 359) based on Eckfeldt collections from Camden. As is the case of several other *Usnea* names included here, *U. barbata* var. *plicata* was widely applied historically to multiple species with pendant thalli and it is unclear which taxa this report would correspond to today.
- Usnea barbata* var. *rubiginea* Michx. – This taxon was reported by Britton (1889) and is now treated as *U. strigosa* subsp. *rubiginea* (Michx.) I. Tav., or more frequently is simply treated as a synonym of *U. strigosa*. The report by Britton, however, almost certainly refers to *U. rubicunda*.
- Usnea longissima* Ach. – This taxon was reported by Wood (1914), however it does not occur in New Jersey (Brodo et al. 2001). The report could refer to any of the pendant *Usnea* species that occur in the region, including either *U. merrillii* or *U. trichodea*.
- Verrucaria fuscella* (Turner) Winch – Britton (1889: 383) reported this species based on material collected on rocks in Sussex by Eckfeldt. We have included this name in the list of excluded species because the taxonomy of saxicolous *Verrucaria* from non-calcareous rocks in eastern North America is extremely poorly understood and the vouchers have not been reexamined.
- Verrucaria nigrescens* “var. *eleochrea* Tuck.” – Britton (1889: 383) reported this name based on material collected on shale by Eckfeldt in Sussex. We have included this name in the list of excluded species because the taxonomy of saxicolous *Verrucaria* from non-calcareous rocks in eastern North America is extremely poorly understood and the vouchers have not been reexamined.
- Verrucaria rupestris* Schrad. – Britton (1889: 383) reported this taxon based on material collected by Eckfeldt on rocks in Warren, and it was also reported by Moldenke (1935). We have included this name in the list of excluded species because the taxonomy of saxicolous *Verrucaria* from non-calcareous rocks in eastern North America is extremely poorly understood and the vouchers have not been reexamined.
- Verrucaria virens* Deakin – Britton (1889: 383) reported this species from the same locality as *V. rupestris*. We have included this name in the list of excluded species because the taxonomy of saxicolous *Verrucaria* from non-calcareous rocks in eastern North America is extremely poorly understood and the vouchers have not been reexamined.

Xanthoria fulva (Hoffm.) Poelt & Petut. – This species was reported by Lendemer (2004) but the material from New Jersey is now treated as *Xanthomendoza weberi* (Knudsen et al. 2011).

Xanthoria polycarpa (Hoffm.) Th. Fr. – This species was reported by Wood (1914) and the report likely corresponds to *Xanthomendoza hasseana*. Refer to the entry for *Teloschistes polycarpus* in this section for additional details.

Xylographa parallela (Ach.) Fr. – This species was reported by Wood (1914), however the two specimens we examined represented other species of *Xylographa*.

ACKNOWLEDGEMENTS

The first author thanks I. M. Brodo, Stephen Clayden, Richard Harris, Malcolm Hodges, Fred Olday, and the second author for guidance and encouragement. Waters also acknowledges the important role of Joerg Henner-Lotze at the Eagle Hill Institute in fostering lichenological education. The second author thanks the following for their companionship in the field: J.L. Allen, W. Bien, D. Hewitt, B.P. Hodkinson, N. Howe, S. Joneson, A. Moroz, W. Roberts, A.E. Schuyler, A. Suggs. Lendemer also thanks Gerry Moore and Alfred Schuyler for their mentorship during his tenure at the Academy of Natural Sciences of Philadelphia, and to Richard Harris and Bill Buck for their mentorship during his tenure at the New York Botanical Garden and City University of New York.

LITERATURE CITED

- ALLEN, J. L. AND N. M. HOWE. 2016. Landfill Lichens: A checklist for Freshkills Park, Staten Island, New York. *Opuscula Philolichenum* 15: 82–91.
- ALLEN, J. L. AND J. C. LENDEMER. 2015. *Japewiella dollypartoniana*, a new widespread lichen in the Appalachian Mountains of Eastern North America. *Castanea* 80: 59–65.
- ALLEN, J. L. AND J. C. LENDEMER. 2016. Climate change impacts on endemic, high-elevation lichens in a biodiversity hotspot. *Biodiversity and Conservation* 25(3): 555–568.
- AMTOFT, A., F. LUTZONI AND J. MIADLIKOWSKA. 2008. *Dermatocarpon* (Verrucariaceae) in the Ozark Highlands, North America. *The Bryologist* 111(1): 1–40.
- ARGÜELLO, A., R. DEL PRADO, P. CUBAS AND A. CRESPO. 2007. *Parmelia quercina* (Parmeliaceae, Lecanorales) includes four phylogenetically supported morphospecies. *Biological Journal of the Linnean Society* 91: 455–467.
- ARUP, U. 2006. A new taxonomy of the *Caloplaca citrina* group in the Nordic countries, except Iceland. *The Lichenologist* 38(1): 1–20.
- ARVIDSSON, L. AND D. J. GALLOWAY. 1979. The lichen genus *Coccocarpia* in New Zealand. *Botaniska Notiser* 132: 239–246.
- BARD, G. E. 1952. Secondary Succession on the Piedmont of New Jersey. *Ecological Monographs* 22: 195–215.
- BARTON, J. W. AND J. C. LENDEMER. 2014. *Micarea micrococca* and *M. prasina*, a summary of two very similar species in eastern North America. *The Bryologist* 117: 223–231.
- BLANCO, O., A. CRESPO, P. K. DIVAKAR, T. L. ESSLINGER, D. L. HAWKSWORTH AND H. T. LUMBSCH. 2004. *Melanelixia* and *Melanohalea*, two new genera segregated from *Melanelia* (Parmeliaceae) based on molecular and morphological data. *Mycological Research* 108(8): 873–884.
- BOOM, B. 1996. 125 years of floristic research and collecting at The New York Botanical Garden. *Brittonia* 48(3): 281–284.
- BRAKO, L. 1991. *Phyllopsora* (Bacidiaceae). *Flora Neotropica* 55: 1–66.
- BRENDEL, F. 1879. Historical Sketch of the Science of Botany in North America from 1635 to 1840. *The American Naturalist* 13(12): 754–771.

- BRITTON, N. L. 1889. *Catalogue of Plants Found in New Jersey. Final Report of the State Geologist*. Trenton, NJ: John L. Murphy Publishing Co.
- BRODO, I. M. 1968. The lichens of Long Island, New York: A vegetational and floristic analysis. *New York State Museum and Science Service, Bulletin* 410: i–x, 1–330.
- BRODO, I. M. 1984. The North American species of the *Lecanora subfusca* group. *Beiheft zur Nova Hedwigia* 79: 63–185.
- BRODO, I. M. 2000. Lichenology in the American Bryological and Lichenological Society: 1899–1999. *The Bryologist* 103(1): 15–27.
- BRODO, I. M., W. L. CULBERSON AND C. F. CULBERSON. 2008. *Haematomma* (Lecanoraceae) in North and Central America, including the West Indies. *The Bryologist* 111: 363–423.
- BRODO, I. M. AND D. L. HAWKSWORTH. 1977. *Alectoria* and allied genera in North America. *Opera Botanica* 42: 1–164.
- BRODO, I. M. AND H. VÄNSKÄ. 1984. Notes on the maritime, lignicolous lichen *Lecanora orae-frigidae*. *The Lichenologist* 16: 45–51.
- BRODO, I. M. AND J. C. LENDEMER. 2015. A revision of the saxicolous, esorediate species of *Ainoa* and *Trapelia* (Baeomycetaceae and Trapeliaceae, lichenized Ascomycota) in North America, with the description of two new species. *The Bryologist* 118: 385–399.
- BRODO, I. M., S. DURAN SHARNOFF AND S. SHARNOFF. 2001. *Lichens of North America*. Yale University Press, New Haven & London.
- CONSORTIUM OF NORTH AMERICAN LICHEN HERBARIA (CNALH). 2018. <http://lichenportal.org/portal/index.php>. Accessed 09 January 2018.
- COPPINS, B. J. 2008. *Micarea perparvula* in North America. *Opuscula Philolichenum* 5: 23–24.
- COPPINS, B. J. AND P. F. MAY. 2001. *Micarea neostipitata*, a new species with pale stipitate pycnidia from eastern North America. *The Lichenologist* 33: 487–490.
- CULBERSON, W. L. 1961. The *Parmelia quercina* group in North America. *American Journal of Botany* 48(2): 168–174.
- CULBERSON, C. F., W. L. CULBERSON AND A. JOHNSON. 1985. Orcinol-type depsides and depsidones in the lichens of the *Cladonia chlorophaea* group (Ascomycotina, Cladoniaceae). *The Bryologist* 88: 380–387.
- CULBERSON, W. L. AND C. F. CULBERSON. 1967. A new taxonomy for the *Cetraria ciliaris* group. *The Bryologist* 70: 158–166.
- CULBERSON, W. L. AND C. F. CULBERSON. 1968. The lichen genera *Cetrelia* and *Platismatia* (Parmeliaceae). *Contributions from the United States National Herbarium* 34(7): 449–558.
- CULBERSON, W. L., C. F. CULBERSON AND A. JOHNSON. 1982. A new endemic red-fruited *Cladonia* from the North Carolina coast. *Mycologia* 74: 662–667.
- CULBERSON, W. L., R. S. EGAN, T. L. ESSLINGER, B. P. HODKINSON AND J. C. LENDEMER. 2017. Recent literature on lichens. <http://nhm2.uio.no/lichens/rll.html>.
- DARLINGTON, W. 1853. *Flora Cestrica an Herborizing Companion for the Young Botanists of Chester County, State of Pennsylvania*. Philadelphia, PA.
- DIBBEN, M. J. 1980. The Chemosystematics of the Lichen Genus *Pertusaria* in North America North of Mexico. *Milwaukee Public Museum Publications in Biology and Geology* 5: 1–162.
- DIX, W. L. 1942. Rare *Cladoniae* in New Jersey. *Torreya* 42: 49–50.
- EKMAN, S. 1996. The corticolous and lignicolous species of *Bacidia* and *Bacidina* in North America. *Opera Botanica* 127: 1–148.
- ERTZ, D. AND A. TEHLER. 2011. The phylogeny of Arthoniales (Pezizomycotina) inferred from nucLSU and RPB2 sequences. *Fungal Diversity* 49(1): 47–71.
- ESSLINGER, T. L. 2016. A cumulative checklist for the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada, version 21. *Opuscula Philolichenum* 15: 135–390.
- ESSLINGER, T. L. 2017. A new circumscription for the common and widespread North American species *Physcia subtilis*, and description of a new species, *P. thomsoniana*. *Opuscula Philolichenum* 16: 139–152.

- EVANS, A. W. 1935. The Cladoniae of New Jersey. *Torreya* 35: 81–109.
- EVANS, A. W. 1938. The Cladoniae of New Jersey—supplement. *Torreya* 38: 137–149.
- EVANS, A. W. 1940. The Cladoniae of New Jersey—second supplement. *Torreya* 40: 141–165.
- FINK, B. 1904. Two centuries of North American lichenology. *Bulletin of the Iowa Academy of Science* 1904: 11–38.
- FONTAINE, K. M., T. AHTI AND M. D. PIERCEY-NORMORE. 2010. Convergent evolution in *Cladonia gracilis* and allies. *The Lichenologist* 42(3): 323–338.
- FORMAN, R. T. T. 1998. Common bryophytes and lichens of the New Jersey Pine Barrens. pp. 407–424. In: *Pine Barrens Ecosystem and Landscape*. R. T. T. Forman (ed.). New Brunswick, NJ: Rutgers University Press.
- FRYDAY, A. 2000. On *Rhizocarpon obscuratum* (Ach.) Massal., with notes on some related species in the British Isles. *The Lichenologist* 32: 207–224.
- FRYDAY, A. M. 2002. A revision of the species of the *Rhizocarpon hochstetteri* group occurring in the British Isles. *The Lichenologist* 34(6): 451–477.
- FRYDAY, A. M., C. PRINTZEN AND S. EKMAN. 2014. *Bryobilimbia*, a new generic name for *Lecidea hypnorum* and closely related species. *The Lichenologist* 46(1): 25–37.
- GLENN, M. G., E. V. ORSI AND M. E. HEMSLEY. 1991. Lichen metal contents as correlates of air filter measurements. *Grana* 30: 44–47.
- GUEIDAN, C. AND J. C. LENDEMER. 2015. Molecular data confirm morphological and ecological plasticity within the North American endemic lichen *Willeya diffractella* (Verrucariaceae). *Systematic Botany* 40(2): 369–375.
- HAFELLNER, J. 1981. Monographie der Flechtengattung *Letrouitia* (Lecanorales, Teloschistineae). *Nova Hedwigia* 35: 645–729.
- HAFELLNER, J. AND R. TÜRK. 2016. The lichenized fungi of Austria – a new checklist of the taxa so far recorded, with data to distribution and substrate ecology. *Stapfia* 104(1): 1–216.
- HALE, M. E. 1971. *Parmelia squarrosa*, a new species in section *Parmelia*. *Phytologia* 22: 29.
- HALE, M. E. 1976a. A monograph of the lichen genus *Pseudoparmelia* Lynge (Parmeliaceae). *Smithsonian Contributions to Botany* 31: 1–62.
- HALE, M. E. 1976b. A monograph of the lichen genus *Parmelina* Hale (Parmeliaceae). *Smithsonian Contributions to Botany* 33: 1–60.
- HALE, M. E. 1987. A monograph of the lichen genus *Parmelia* Acharius *sensu stricto* (Ascomycotina: Parmeliaceae). *Smithsonian Contributions to Botany* 66: 1–55.
- HALSEY, A. 1823. Synoptical view of the lichens, growing in the vicinity of the city of New-York. *Annals of the Lyceum of Natural History of New-York* 1826–1826: 3–21.
- HARRIS, R. C. 1973. The corticolous pyrenolichens of the Great Lakes region. *Michigan Botanist* 12: 3–68.
- HARRIS, R. C. 1984. *Megalospora porphyritis* in eastern North America. *Evansia* 1: 24.
- HARRIS, R. C. 1985. Lichens of the New Jersey pine barrens collected on the seventh A. Leroy Andrews Foray, 1982. *Evansia* 2: 44–47.
- HARRIS, R. C. 1989. A sketch of the family Pyrenulaceae (Melanommatales) in eastern North America. *Memoirs of the New York Botanical Garden* 49: 74–107.
- HARRIS, R. C. 2006. A preliminary glance at *Maronea* (Fuscideaceae) in North America. *Opuscula Philolichenum* 3: 65–68.
- HARRIS, R. C. 2009. Four novel lichen taxa in the lichen biota of eastern North America. *Opuscula Philolichenum* 6: 149–156.
- HARRIS, R. C., I. M. BRODO AND T. TØNSBERG. 2000. *Lecanora thysanophora*, a common leprose lichen in eastern North America. *The Bryologist* 103: 790–793.
- HARRIS, R. C. AND J. C. LENDEMER. 2006. Contributions to the lichen flora of Pennsylvania: additions to the checklist of lichens of the Delaware Water Gap National Recreation Area. *Opuscula Philolichenum* 3: 69–78.
- HARRIS, R. C. AND J. C. LENDEMER. 2009. The *Fellhanera silicis* group in eastern North America. *Opuscula Philolichenum* 6: 157–174.

- HARRIS, R. C. AND J. C. LENDEMER. 2010. A review of *Lecania croatica* (syn. *Catillaria croatica*) in North America. *Opuscula Philolichenum* 8: 41–49.
- HARSHBERGER, J. W. 1899. *The botanists of Philadelphia and their work*. Philadelphia, PA; T.C. Davis.
- HASTINGS, G. T. 1940. Trip of May 17–19 to Branchville, N.J. *Torreya* 40: 132–134.
- HAWKSWORTH, D. L. 1981. The lichenicolous Coleomycetes. *Bulletin of the British Museum (Natural History), Botany Series* 9: 1–98.
- HAWKSWORTH, D. L. 1985. A redistribution of the species referred to the ascomycete genus *Microthelia*. *Bulletin of the British Museum (Natural History), Botany Series* 14(2): 43–181.
- HAWKSWORTH, D. L. 2004. Rediscovery of the original material of Osbeck's *Lichen chinensis* and the re-establishment of the name *Parmotrema perlatum*. *Herzogia* 17: 37–44.
- HELLER, A. A. 1893. *Preliminary enumeration of the lichens of Lancaster County, Pennsylvania*. Lancaster, Pennsylvania.
- HENSSEN, A. 1994. Contribution to the morphology and species delimitation in *Heppia sensu stricto* (lichenized Ascomycotina). *Acta Botanica Fennica* 150: 57–73.
- HINDS, J. W. 1998. Lichen flora of eastern North America: The genus *Parmelia sensu stricto*. pp. 53–69. In: *Lichenographia Thomsoniana: North American Lichenology in Honor of John W. Thomson*. Glenn, M. G., R. C. Harris, R. Dirig and M. S. Cole (eds.). Mycotaxon Ltd., Ithaca, New York.
- HINDS, J. W. AND P. L. HINDS. 2007. The Macrolichens of New England. *Memoirs of the New York Botanical Garden* 96: 1–584.
- HODKINSON, B. P. AND J. C. LENDEMER. 2011. Molecular analyses reveal semi-cryptic species in *Xanthoparmelia tasmanica*. *Bibliotheca Lichenologica* 106: 108–119.
- HOWE, N. M. 2016. *Soil Lichen Communities of the New Jersey Pinelands and Their Effects on Belowground Patterns and Processes*. Ph.D. Dissertation, Graduate School-New Brunswick; Rutgers, The State University of New Jersey.
- IMSHAUG, H. A. AND I. M. BRODO. 1966. Biosystematic studies on *Lecanora pallida* and some related lichens in the Americas. *Nova Hedwigia* 12: 1–59.
- KEENEY, E. B. 1992. *The Botanizers*. The University of North Carolina Press, Chapel Hill & London.
- KELLER, I. A. AND S. BROWN. 1905. *Handbook of the flora of Philadelphia and vicinity, containing data relating to the plants within the following radius: eastern Pennsylvania, north to the Blue Mountains, and west to the Susquehanna; all of New Jersey except the northern counties; and New Castle County, Delaware, with keys for identification of species*. Philadelphia Botanical Club, Philadelphia, Pennsylvania.
- KIVIAT, E. AND K. MACDONALD. 2002. *Hackensack Meadowlands, New Jersey, Biodiversity: A Review and Synthesis*. Hudsonia Ltd., Annandale, New York.
- KNUDSEN, K. AND A. FLAKUS. 2016. The identity of *Acarospora xanthophana* (Fungi: Ascomycota) and a description of *A. congregata* sp. nov. to accommodate a widely distributed saxicolous species occurring in the higher elevations of South America. *Taxon* 65: 146–151.
- KNUDSEN, K. AND J. C. LENDEMER. 2007. Studies in lichens and lichenicolous fungi: notes on some North American taxa. *Mycotaxon* 101: 81–87.
- KNUDSEN, K., J. C. LENDEMER AND R. C. HARRIS. 2011. Studies in lichens and lichenicolous fungi – no. 15: Miscellaneous notes on species from eastern North America. *Opuscula Philolichenum* 9: 45–75.
- KROG, H. 1982. *Punctelia*, a new lichen genus in the Parmeliaceae. *Nordic Journal of Botany* 2: 287–292.
- KUKWA, M. 2011. *The lichen genus Ochrolechia in Europe*. Fundacja Rozwoju Uniwersytetu Gdańskiego, Gdańsk, Poland.
- LAGRECA, S., E. LAY, D. GREENE, E. KNEIPER AND M. LINCOLN. 2005. The lichens and bryophytes of the Boston Harbor Islands. *Northeastern Naturalist*, Special Issue 12(3): 77–98.
- LAGRECA, S. AND H. T. LUMBSCH. 2001. Three species of *Lecanora* new to North America, with notes on other poorly known Lecanoroid lichens. *The Bryologist* 104: 204–211.
- LEAVITT, S. D., P. K. DIVAKAR, Y. OHMURA, L.-S. WANG, T. L. ESSLINGER AND H. T. LUMBSCH. 2015. Who's getting around? Assessing species diversity and phylogeography in the widely distributed

- lichen-forming fungal genus *Montanelia* (Parmeliaceae, Ascomycota). *Molecular Phylogenetics and Evolution* 90: 85–96.
- LENDEMER, J. C. 2004. Recent records of lichens in the local area (MD, NJ, PA). I. *Opuscula Philolichenum* 1: 9–20.
- LENDEMER, J. C. 2006. Contributions to the lichen flora of New Jersey: a preliminary checklist of the lichens of Wharton State Forest. *Opuscula Philolichenum* 3: 21–40.
- LENDEMER, J. C. 2007. The occurrence of *Endocarpon pallidulum* and *Endocarpon petrolepidium* in Eastern North America. *Evansia* 24(4): 103–107.
- LENDEMER, J. C. 2008. New and interesting records of lichens and lichenicolous fungi from New Jersey and Pennsylvania. *Evansia* 25: 102–109.
- LENDEMER, J. C. 2008a. A note on the occurrence of *Psora ictérica* in eastern North America. *Evansia* 25: 1–2.
- LENDEMER, J. C. 2008b. Studies in lichens and lichenicolous fungi: notes on some taxa from eastern North America. *Mycotaxon* 104: 325–329.
- LENDEMER, J. C. 2010. Contributions to the lichen flora of Pennsylvania — further new and interesting reports of lichens and lichenicolous fungi. *Evansia* 27: 47–64.
- LENDEMER, J. C. 2011a. Contributions to the lichen flora of Pennsylvania — rare and important lichen habitats and lichen communities: Part 1, the northeastern counties. *Bartonia* 65: 20–28.
- LENDEMER, J. C. 2011b. A review of the morphologically similar species *Fuscidea pusilla* and *Ropalospora viridis* in eastern North America. *Opuscula Philolichenum* 9: 11–20.
- LENDEMER, J. C. 2013. A monograph of the crustose members of the genus *Lepraria* Ach. s. str. (Stereocaulaceae, Lichenized Ascomycetes) in North America north of Mexico. *Opuscula Philolichenum* 12: 27–141.
- LENDEMER, J. C. 2015a. *Lecanora layana* (Lecanoraceae), a new sorediate species widespread in temperate eastern North America. *The Bryologist* 118: 145–153.
- LENDEMER, J. C. 2015b. *Parmotrema internexum* (Lecanorales: Parmeliaceae): an overlooked macrolichen in southeastern North America highlights the value of basic biodiversity research. *The Bryologist* 118: 130–144.
- LENDEMER, J. C. 2016. A new look at *Parmotrema madagascariaceum* and *P. xanthinum* in North America. *The Journal of the Torrey Botanical Society* 143: 285–297.
- LENDEMER, J. C. 2017. Revision of *Gyalideopsis ozarkensis* and *G. subaequatoriana* (Gomphillaceae; lichenized Ascomycetes), leads to the description of an overlooked new species. *The Bryologist* 120(3): 274–286.
- LENDEMER, J. C. AND J. L. ALLEN. 2014. Lichen biodiversity under threat from sea-level rise in the Atlantic Coastal Plain. *BioScience* 64: 923–931.
- LENDEMER, J. C. AND J. L. ALLEN. 2015. Reassessment of *Hypotrachyna virginica*, an endangered, endemic Appalachian macrolichen, and the morphologically similar species with which it has been confused. *Proceedings of the Academy of Natural Sciences of Philadelphia* 164: 279–289.
- LENDEMER, J. C. AND J. A. ELIX. 2010. Two new species of *Chrysothrix* from eastern North America. *Opuscula Philolichenum* 8: 51–58.
- LENDEMER, J. C. AND R. C. HARRIS. 2013. *Cladonia appalachensis*, belated description of a southern Appalachian lichen endemic from the Great Smoky Mountains. *Opuscula Philolichenum* 12: 17–22.
- LENDEMER, J. C. AND R. C. HARRIS. 2016a. The New York Botanical Garden Lichen Herbarium: A unique resource for fungal biodiversity research and education. *Brittonia* 68(3): 334–340.
- LENDEMER, J. C. AND R. C. HARRIS. 2016b. Studies in lichens and lichenicolous fungi—no. 20: Further notes on species from eastern North America. *Opuscula Philolichenum* 15: 105–131.
- LENDEMER, J. C. AND R. C. HARRIS AND D. LADD. 2016a. The faces of *Bacidia schweinitzii*: molecular and morphological data reveal three new species including a widespread sorediate morph. *The Bryologist* 119: 143–171.
- LENDEMER, J. C., R. C. HARRIS AND A. M. RUIZ. 2016b. A review of the lichens of the Dare Regional Biodiversity Hotspot in the Mid-Atlantic Coastal Plain of North Carolina, eastern North America. *Castanea* 81(1): 1–77.

- LENDEMER, J. C., R. C. HARRIS AND E. A. TRIPP. 2013. The lichens and allied fungi of Great Smoky Mountains National Park: an annotated checklist with comprehensive keys. *Memoirs of the New York Botanical Garden* 104: 1–152.
- LENDEMER, J. C. AND B. P. HODKINSON. 2009. The Wisdom of Fools: new molecular and morphological insights into the North American apodetiate species of *Cladonia*. *Opuscula Philolichenum* 7: 79–100.
- LENDEMER, J. C. AND R. LÜCKING. 2004. *Gyalideopsis moodyae* (Ostropales: Gomphillaceae), a new lichen species from eastern North America. *The Bryologist* 107: 234–236.
- LENDEMER, J. C. AND M. WESTBERG. 2010. *Candelariella xanthostigmoides* in North America. *Opuscula Philolichenum* 8: 75–81.
- LINDBLOM, L. 1997. The genus *Xanthoria* (Fr.) Th. Fr. in North America. *Journal of the Hattori Botanical Laboratory* 83: 75–172.
- LITTLE, S. 1951. Observations on the minor vegetation of the pine barren swamps in southern New Jersey. *Bulletin of the Torrey Botanical Club* 78: 153–160.
- LÜCKING, R., W. R. BUCK AND E. RIVAS PLATA. 2007. The lichen family Gomphillaceae (Ostropales) in eastern North America, with notes on hyphophore development in *Gomphillus* and *Gyalideopsis*. *The Bryologist* 110: 622–672.
- LÜCKING, R., B. MONCADA, B. MCCUNE, E. FARKAS, B. GOFFINET, D. PARKER, J. L. CHAVES, L. LÓKÖS, P. R. NELSON, T. SPRIBILLE, S. STENROOS, T. WHEELER, A. YANEZ-AYABACA, K. DILLMAN, O. T. GOCKMAN, T. GOWARD, J. HOLLINGER, E. A. TRIPP, J. VILLELLA, W. R. ÁLVARO-ALBA, J. C. ARANGO, M. E. S. CÁCERES, L. F. COCA, C. PRINTZEN, C. RODRÍGUEZ, K. SCHARNAGL, R. ROZZI, E. SOTO-MEDINA AND L. S. YAKOVCHENKO. 2017. *Pseudocyphellaria crocata* (Ascomycota: Lobariaceae) in the Americas is revealed to be thirteen species, and none of them is *P. crocata*. *The Bryologist* 120(4): 441–500.
- LÜCKING, R., F. SEAVEY, R. COMMON, S. Q. BEECHING, O. BREUSS, W. R. BUCK, L. CRANE, M. HODGES, B. P. HODKINSON, E. LAY, J. C. LENDEMER, R. T. MCMULLIN, J. A. MERCADO-DÍAZ, M. P. NELSEN, E. RIVAS PLATA, W. SAFRANEK, W. B. SANDERS, H. P. SCHAEFER JR. AND J. SEAVEY. 2011. The lichens of Fakahatchee Strand Preserve State Park, Florida: Proceedings from the 18th Tuckerman Workshop. *Bulletin of the Florida Museum of Natural History* 49(4): 127–186.
- LUTZONI, F. M. 1994. *Ionaspis alba* (Ascomycotina, Hymeneliaceae), a new lichen species from eastern North America. *The Bryologist* 97: 393–395.
- MAGAIN, N., E. SÉRUSIAUX, M. P. SÉRUSIAUX, F. LUTZONI AND J. MIADLIKOWSKA. 2016. Disentangling the *Peltigera polydactylon* species complex by recognizing two new taxa, *P. polydactylon* subsp. *udeghe* and *P. seneca*. *Herzogia* 29(2): 514–528.
- MCMULLIN, R. T. 2015. A review of *Physconia subpallida* in Canada. *Opuscula Philolichenum* 14: 109–115.
- MIADLIKOWSKA, J., C. L. SCHOCH, S. A. KAGEYAMA, K. MOLNAR, F. LUTZONI AND B. MCCUNE. 2011. *Hypogymnia* phylogeny, including *Cavernularia*, reveals biogeographic structure. *The Bryologist* 114(2): 392–400.
- MOLDENKE, H. N. 1934. *The Observed Flora of Watchung, N.J., and Its Immediate Vicinity, 3rd Edition*. Elsinore Press, Watchung, New Jersey.
- MOLDENKE, H. N. 1934a. 3rd Addenda to *The Observed Flora of Watchung, N.J., and Its Immediate Vicinity, 3rd Edition*.
- MOLDENKE, H. N. 1935. 4th Addenda and Errata to *The Observed Flora of Watchung, N.J., and Its Immediate Vicinity, 3rd Edition*.
- MOLDENKE, H. N. 1938. 7th Supplement to *The Observed Flora of Watchung, N.J., and Its Immediate Vicinity, 3rd Edition*.
- MOLDENKE, H. N. 1939. 8th Supplement to *The Observed Flora of Watchung, N.J., and Its Immediate Vicinity, 3rd Edition*.
- MOLDENKE, H. N. 1940. 11th Supplement to *The Observed Flora of Watchung, N.J., and Its Immediate Vicinity, 3rd Edition*.

- MONGKOLSUK, P., S. MEESIM, V. POENGUNGNOEN, K. BUARUANG, F. SCHUMM AND K. KALB. 2015. The lichen family Physciaceae in Thailand—II. Contributions to the genus *Heterodermia sensu lato*. *Phytotaxa* 235(1): 1–66.
- MOUL, E. T. AND M. F. BUELL. 1955. Moss cover and rainfall interception in frequently burned sites in the New Jersey pine barrens. *Bulletin of the Torrey Botanical Club* 82: 155–162.
- MUHLENBERG, G. H. E. 1813. *Catalogus Plantarum Americae Septentrionalis, etc.* Lancaster, Pennsylvania.
- NASH, T. H. 1972. Simplification of the Blue Mountain lichen communities near a zinc factory. *The Bryologist* 75: 315–324.
- NASH III, T. H., C. GRIES AND G. RAMBOLD. 2002. Lichen floras: past and future for North America. *The Bryologist* 105(4): 635–640.
- NEARING, G. G. 1940. Trip of March 8 to Pine Brook, N.J. *Torrey* 40: 127–128.
- NEARING, G. G. 1940a. Trip of March 31 to Mahwah, N.J. *Torrey* 40: 130.
- NELSEN, M. P. 2006. An addition to the lichen flora of New Jersey: The basidiolichen *Multiclavula vernalis* (Schw.) Petersen. *Evansia* 23: 11.
- NELSEN, M., R. LÜCKING, E. R. PLATA AND J. S. MBATCHOU. 2010. *Heiomasia*, a new genus in the lichen-forming family Graphidaceae (Ascomycota: Lecanoromycetes: Ostropales) with disjunct distribution in Southeastern North America and Southeast Asia. *The Bryologist* 113(4): 742–751.
- NICHOLSON, D. H. 1991. A history of botanical nomenclature. *Annals of the Missouri Botanical Garden* 78(1): 33–56.
- NIERING, W. A. 1953. The past and present vegetation of High Point State Park, New Jersey. *Ecological Monographs* 23: 127–148.
- NORDIN, A., S. SAVIĆ AND L. TIBELL. 2010. Phylogeny and taxonomy of *Aspicilia* and Megasporaceae. *Mycologia* 102: 1339–1349.
- NÚÑEZ-ZAPATA, J., P. CUBAS, D. L. HAWKSWORTH AND A. CRESPO. 2015. Biogeography and genetic structure in populations of a widespread lichen (*Parmelina tiliacea*, Parmeliaceae, Ascomycota). *PLoS ONE* 10(5): e0126981.
- NYLANDER, W. 1885. Arthoniae novae Americae borealis. *Flora* 68: 311–313.
- OLSSON, H. 1998. Vegetation of the New Jersey pine barrens: a phytosociological classification. pp. 245–263. In: *Pine Barrens Ecosystem and Landscape*. R. T. T. Forman (ed.). Rutgers University Press, New Brunswick, New Jersey.
- ORSI, E. V. AND M. G. GLENN. 1991. Lichens as microenvironment markers of air quality: relative to topography, wind direction and vehicular traffic patterns. *Grana* 30: 51–58.
- PENNELL, F. W. 1941. Botanical collectors of the Philadelphia local area. *Bartonia* 21: 38–57.
- PRINTZEN, C. 2001. Corticolous and lignicolous species of *Lecanora* (Lecanoraceae, Lecanorales) with usnic or isousnic acid in the Sonoran Desert Region. *The Bryologist* 104: 382–409.
- PRINTZEN, C., S. EKMAN AND T. TØNSBERG. 2003. Phylogeography of *Cavernularia hultenii*: evidence of slow genetic drift in a widely disjunct lichen. *Molecular Ecology* 12(6): 1473–1486.
- PRINTZEN, C. AND T. TØNSBERG. 2004. New and interesting *Biatora*-species, mainly from North America. *Symbolae Botanicae Upsalienses* 34: 343–357.
- RAPP JR., W. F. AND J. L. C. RAPP. 1946. Notes on the mosses and lichens of the Great Swamp (New Jersey). *Bulletin of the Torrey Botanical Club* 73: 91–92.
- ROSENTERER, R. AND J. BELNAP. 2001. Biological soil crusts of North America. pp. 31–50. In: *Biological Soil Crusts: Structure, Function, and Management*, J. Belnap and O. L. Lange (eds.). Springer, New York.
- SEAVEY, F., J. SEAVEY, J. GAGNON, J. GUCCION, B. KAMINSKY, J. PEARSON, A. PODARIL AND B. RANDALL. 2017. The lichens of Dagny Johnson Key Largo Hammock Botanical State Park, Key Largo, Florida, USA. *Bulletin of the Florida Museum of Natural History* 53(5): 201–268.
- SEDIA, E. G. AND J. G. EHRENFELD. 2003. Lichens and mosses promote alternate stable plant communities in the New Jersey Pinelands. *Oikos* 100: 447–458.

- SEDIA, E. G. AND J. G. EHRENFELD. 2005. Differential effects of lichens, mosses and grasses on respiration and nitrogen mineralization in soils of the New Jersey Pinelands. *Oecologia* 144: 137–147.
- SEDIA, E. G. AND J. G. EHRENFELD. 2006. Differential effects of lichens and mosses on soil enzyme activity and litter decomposition. *Biology and Fertility of Soils* 43: 177–189.
- SELVA, S. B. 2014. The calicioid lichens and fungi of the Acadian Forest ecoregion of northeastern North America, II. The rest of the story. *The Bryologist* 117(4): 336–367.
- SHEARD, J. W. 1995. disjunct distributions of some North American, corticolous, vegetatively reproducing *Rinodina* species (Physciaceae, lichenized Ascomycetes). *Herzogia* 11: 115–132.
- SHEARD, J. W. 2010. *The Lichen Genus Rinodina* (Lecanoromycetidae, Physciaceae) in North America, North of Mexico. National Research Council of Canada, NRC Research Press, Ottawa.
- SHEARD, J. W., A. K. EZHKIM, I. R. GALANINA, D. HIMELBRANT, E. KUZNETSOVA, A. SHIMIZU, I. STEPANCHIKOVA, G. THOR, T. TØNSBERG, L. S. YAKOVCHENKO AND T. SPRIBILLE. 2017. The lichen genus *Rinodina* (Physciaceae, Caliciales) in north-eastern Asia. *The Lichenologist* 49(6): 617–672.
- SHEARD, J. W., B. MCCUNE AND T. TØNSBERG. 2014. A new corticolous species of *Rinodina* (Physciaceae) and two interesting range extensions for species collected from Katmai National Park, Alaska. *The Bryologist* 117(3): 253–258.
- SIERK, H. A. 1964. The genus *Leptogium* in North America north of Mexico. *The Bryologist* 67: 245–317.
- SIPMAN, H. J. M. 1983. A monograph of the lichen family Megalosporaceae. *Bibliotheca Lichenologica* 18: 1–241.
- SMITH, C. E. 1962. Henry Muhlenberg-Botanical Pioneer. *Proceedings of the American Philosophical Society* 106(5): 443–460.
- SPRIBILLE, T., B. KLUG AND H. MAYRHOFFER. 2011. A phylogenetic analysis of the boreal lichen *Mycoblastus sanguinarius* (Mycoblastaceae, lichenized Ascomycota) reveals cryptic clades correlated with fatty acid profiles. *Molecular Phylogenetics and Evolution* 59(3): 603–614.
- SPRIBILLE, T. S. PÉREZ-ORTEGA, T. TØNSBERG AND D. SCHIROKAUER. 2010. Lichens and lichenicolous fungi of the Klondike Gold Rush National Historic Park, Alaska, in a global biodiversity context. *The Bryologist* 113(3): 439–515.
- STAIGER, B. 2002. Die Flechtenfamilie Graphidaceae: Studien in Richtung einer natürlicheren Gliederung. *Bibliotheca Lichenologica*, 85: 1–526.
- STONE, D. F., J. W. HINDS, F. L. ANDERSON AND J. C. LENDEMER. 2016. A revision of the *Leptogium saturninum* group in North America. *The Lichenologist* 48: 387–421.
- STONE, W. 1911. The plants of southern New Jersey; with especial reference to the flora of the pine barrens and the geographic distribution of the species. *Annual Report of the New Jersey State Museum*, 1910(2): 25–828.
- STRUWE, L., ET AL. 2014. The making of a student driven online campus flora: an example from Rutgers University. *Plant Science Bulletin* 60: 159–169.
- TAYLOR, R. M. 1982. *Marine Flora and Fauna of the Northeastern United States. Lichens (Ascomycetes) of the Intertidal Region*. US Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Washington D.C.
- THOMAS, W. W. 2016. 125 years of floristic research and collecting at The New York Botanical Garden. *Brittonia* 68(3): 222–229.
- THOMSON, J. W. 1935. Wawayanda Cedar Swamp, New Jersey, December 2, 1934. *Torreyia* 35: 19–20.
- THOMSON, J. W. 1943. *Parmelia stygia* (L.) Ach. in New Jersey. *The Bryologist* 46: 46.
- TIMDAL, E. 2011. The lichen genus *Phyllopsora* (Ramalinaceae) in the West Indies. *Bibliotheca Lichenologica* 106: 319–351.
- TORREY, R. H. 1933. Lichen excursion at Andover, New Jersey. *Torreyia* 33: 49–50.
- TORREY, R. H. 1933a. Wawayanda Cedar Swamp, March 26. *Torreyia* 33: 97–98.
- TORREY, R. H. 1936. Cape May County New Jersey, October 3–4. *Torreyia* 36: 154–156.
- TORREY, R. H. 1937. *Cetraria islandica* in Sussex County, NJ. *Torreyia* 37: 124–125.

- VELMALA, S., L. MYLLYS, T. GOWARD, H. HOLIEN AND P. HALONEN. 2014. Taxonomy of *Bryoria* section *Implexae* (Parmeliaceae, Lecanoromycetes) in North America and Europe, based on chemical, morphological and molecular data. *Annales Botanici Fennici* 51: 345–371.
- WATERS, D. P. AND J. C. LENDEMER. In review. The lichens and allied fungi of Mercer County, New Jersey.
- WESTBERG, M., A. T. CREWE, O. W. PURVIS AND M. WEDIN. 2011. *Silobia*, a new genus for the *Acarospora smaragdula* complex (Ascomycota, Acarosporales) and a revision of the group in Sweden. *The Lichenologist* 43: 7–25.
- WETMORE, C. M. 1960. The lichen genus *Nephroma* in North and Middle America. *Publications of the Museum of Michigan State University, Biological Series*, 1(11): 369–452.
- WETMORE, C. M. 1987. *Lichens and Air Quality in Delaware Water Gap Recreation Area*. US National Park Service – AIR, Denver Colorado.
- WETMORE, C. M. 2003. The *Caloplaca squamosa* group in North and Central America. *The Bryologist* 106(1): 147–156.
- WETMORE, C. M. AND E. I. KÄRNEFELT. 1999. What is *Caloplaca cinnabarina*? *The Bryologist* 102(4): 683–691.
- WILLEY, H. 1867. American Lichenography. *Proceedings of the Essex Institute* 1867: 191–196.
- WOOD, E. W. 2010. Gray's Herbarium to the Gray Herbarium to the Harvard University Herbaria. *Harvard Papers in Botany* 15(2): 321–342.
- WOOD, G. C. 1914. A preliminary list of the lichens found within a radius of 100 miles of New York City. *Torreya* 14: 73–95.
- ZAMBELL, C. B., J. M. ADAMS, M. L. GORRING AND D. W. SCHWARTZMAN. 2012. Effect of lichen colonization on chemical weathering of hornblende granite as estimated by aqueous elemental flux. *Chemical Geology* 291: 166–174.
- ZDUŃCZYK, A. AND M. KUKWA. 2014. Typification of *Lecanora orosthea* (Lecanorales, Ascomycota). *The Lichenologist* 46: 595–598.

The Philadelphia Botanical Club—Its Role in Citizen Science and an Index to Local Floristic Reports Published in Its Journal, *Bartonia*

DAVID A. HEWITT¹ AND KENNETH D. FRANK

¹Corresponding author: davidhewitt@post.harvard.edu

ABSTRACT. Citizen science is vital to the study of natural history. The Philadelphia Botanical Club exemplifies an organization dedicated to citizen science. Its meetings, field trips, publications, sponsorships and membership all serve to create and disseminate scientific knowledge. This report describes such contributions. An appendix includes an index to local floristic reports published in its journal, *Bartonia*. These include 458 reports of field trips with records of local flora observed; and 72 peer-reviewed papers. The Philadelphia Botanical Club has served as a bastion for botany in the Philadelphia region.

INTRODUCTION

Citizen science is widely recognized as being critical to research and public engagement in natural history (Dickinson et al 2012). Local natural history organizations make critically important contributions to citizen science—i.e., creation and dissemination of scientific knowledge by amateurs or by professionals in an amateur (i.e., unpaid) capacity (McKinley et al 2015).

In the Philadelphia region such organizations include the Philadelphia Botanical Club, the Delaware Valley Ornithological Club, and the American Entomological Society. Other examples in the eastern United States include the New England Botanical Club, the Torrey Botanical Society (in New York City), and the Southern Appalachian Botanical Society.

Here we provide a case study of citizen science in one such organization: the Philadelphia Botanical Club. We provide examples from its current and historic activities and its relationships with other organizations. To document its scientific contributions, we provide an index (in the appendix) of local floristic articles and field trip reports published in its journal, *Bartonia*.

MEETINGS, WORKSHOPS AND FIELD TRIPS

Similar to a professional society such as the Botanical Society of America, the Philadelphia Botanical Club provides networking opportunities and platforms for sharing information. It has held meetings regularly since 1891 (Brown 1908). Each meeting features a formal presentation (see Table 1 for examples), followed by informal discussion and socialization with refreshments. A dinner with the speaker is held before each meeting. Meetings are open to the public at no cost. Meetings, and other information about the Club, are posted on its website, which is maintained by the Club's current Corresponding Secretary, Janet Novak.

Faculty members from local universities have used these meetings to introduce students to botanists and their work, and students have used the meetings to make contact with mentors. The meetings have provided a forum for students funded by the Botanical Club to present their research, and for professionals and amateurs to introduce members to research dedicated to local flora.

Through field trips, the Philadelphia Botanical Club offers forums for exchanging knowledge, making discoveries, and publishing observations. Fifteen field trips occurred in 2017; over 450 have been held since 1977 when systematic documentation of these trips began (Appendix, List 2). These too are offered at no cost and are open to the public; they are posted online months in advance. These provide opportunities for experienced botanists to mentor novices, and for students to gain taxonomic expertise in field botany.

Field trips and meetings also provide opportunities for informal peer review, as experts (paid and unpaid—i.e., professional and amateur) discuss their findings, and ideas about natural history. Working relationships also develop via the Club's activities, and this informal peer review also then proceeds via email and other correspondence. This offers the opportunity for amateurs to engage in every step in the process of scientific research and discovery, and to see first-hand the wide diversity of scientific opinions that can be and are held by experienced and/or professional scientists.

The Philadelphia Botanical Club has organized joint field trips with other local natural history organizations, such as the American Entomological Society and the Delaware Valley Ornithological Club, as well as with other botanical organizations mentioned earlier. It has sponsored botanical workshops; examples of topics include fern identification (Novak 2015) and pine barrens flora (Juelg 2007). Interdisciplinary classes have included horticulture, such as native fern propagation taught at the Morris Arboretum (Draude 2016).

Many gifted amateurs have been supported by natural history organizations—and this support is intellectual, as well as financial. For example, Bayard Long, who never took a paycheck for his work as a botanist, was one of the premier field biologists of the 20th century, counting such eminent professionals as Merritt Fernald of Harvard University as a colleague, and was an integral member of the Philadelphia Botanical Club (Fogg 1969). Arthur Newlin Leeds, one of the founding members of the Philadelphia Botanical Club, after retiring from business in 1926, devoted his time to local botany, especially ferns, and was Treasurer of the Philadelphia Botanical Club from 1893 to 1939 (Pennell 1939). Ted Gordon (who works as an environmental professional as well as a citizen scientist), in addition to serving as President of the Philadelphia Botanical Club for 12 years, also reviewed and edited field trip reports for *Bartonia* for 17 years (1997–2014), and published in 8 issues of *Bartonia* [No. 61 (2002)—No. 68 (2014)] (Ted Gordon, Pers. Comm.).

PEER-REVIEWED JOURNALS, AND TECHNICAL REPORTS

Many local natural history organizations publish peer-reviewed journals. For example, the Delaware Valley Ornithological Club publishes *Cassinia*; the New England Botanical Club, *Rhodora*; the Torrey Botanical Society, *Journal of the Torrey Botanical Society*; the Southern Appalachian Botanical Society, *Castanea*; and until recently the California Malacozoological Society and Northern California Malacozoological Club published *The Veliger*. These journals are published in print and online; in the case of the Philadelphia Botanical Club's journal *Bartonia*, most issues are available free online through Biodiversity Natural Heritage Library (<http://www.biodiversitylibrary.org/>).



Figure 1. Field trip to an alluvial island above the Fairmount Dam in Philadelphia, behind the Philadelphia Museum of Art. The vegetation, growing on silt, represents primary succession and birth of a young virgin forest. A report of findings from this field trip was recorded in *Bartonia* and submitted in more detail to the City of Philadelphia Department of Parks and Recreation (Frank and Hewitt 2014).

The Philadelphia Botanical Club has been publishing *Bartonia* regularly since 1908 (Brown et al 1908). This journal publishes peer-reviewed papers of botanical interest, with a focus on local floristics and plant geography, botanical history, and systematics; a section called “News and Notes” offers brief notes on plant geography and other natural history observations. It has published 72 papers dedicated to local flora (Appendix, List 1).

Bartonia has published records of 458 field trips organized by the Philadelphia Botanical Club (and sometimes jointly with other organizations) since 1977. Collectively, field trip reports incorporate thousands of individual observations on the natural history of the Philadelphia region. Almost all include floristic descriptions and lists of plant species observed at the given locality (Appendix, List 2).

We note here that *Bartonia* and other journals published by natural history organizations are among the few peer-reviewed outlets for local natural history research. We define this research as observational, generally qualitative, anecdotal, non-experimental and not designed explicitly to test hypotheses. Each field trip report published in *Bartonia* constitutes a unique, historical collection of botanical observations in the field specific to a particular time and place in our region; no other publication offers comparable records. *Bartonia* also includes papers of general botanical interest, not specific to the region.

The Philadelphia Botanical Club has produced free-standing local floristic studies. In 1905, it published *A Handbook of the Flora of Philadelphia and Vicinity* (Keller and Brown 1905), which stands as a benchmark for determining changes in flora over the past century. It published an *Annotated Checklist of the Plants of the Wissahickon Valley* (Fogg 1996) as a separate issue of *Bartonia*. The Philadelphia Botanical Club has provided a platform for Club members who are authors of books about local botany and botanical history (e.g., McConnell 2014, Frank 2015, Barnard et al. 2017).

PROVISION OF DATA TO GOVERNMENTAL AGENCIES

In addition to writing scientific articles and reports, members of the Philadelphia Botanical Club have submitted their findings to governmental agencies. From 2014 to 2016, the Philadelphia Botanical Club sponsored a series of field trips coordinated with the City of Philadelphia’s Department of Parks and Recreation. It submitted detailed reports to this agency and to *Bartonia* (Appendix, List 2; Figure 1).

Members of the Philadelphia Botanical Club are alert to unusual flora. As a group they function as an informal botanical surveillance network at two levels: (1) keeping an eye out for locally new species, including those that are potentially invasive and, (2) monitoring species that are rare or endangered. To encourage such observation, the Philadelphia Botanical Club sponsors a “Find Of The Year” contest; discoveries judged most significant are published in *Bartonia*. Members of the Philadelphia Botanical Club have communicated unusual findings to Federal and state databases—for example, for *Herniaria hirsuta* (Flora of Pennsylvania [Timothy Block, Pers. Comm.]; USDA Plants 2017a), *Magnolia macrophylla* (USDA Plants 2017b), and *Magnolia grandiflora* (USDA Plants 2017c; Holmes and Hewitt 2015). Nationwide, citizen scientists as a group constitute a well-recognized resource for detecting species that may threaten the country’s ecological security; no other resource has as many observers (Crall et al 2010).

WORKING WITH OTHER NON-PROFITS

Since its founding over a century ago, many of the officers of the Philadelphia Botanical Club have been members of the Botany Department of the Academy of Natural Sciences

(now part of Drexel University). Historically, members of the Philadelphia Botanical Club have been curators of the Academy's herbarium (including the Philadelphia Botanical Club's herbarium, which is at the Academy) and have left all or part of their estates to support the herbarium. These include Bayard Long (Fogg 1969), Arthur Newlin Leeds (Pennell 1939), Hans Wilkens, and Grace M. Tees.

Currently, the Philadelphia Botanical Club solicits and collects contributions to two funds that support botanical work at the Academy. These funds are the Tees Herbarium Maintenance Fund and the Schuyler Herbarium Internship Fund, both of which support the Flora of Pennsylvania Internship, which is run jointly by the Academy and the Morris Arboretum of the University of Pennsylvania.

Field trips organized by the Philadelphia Botanical Club support local non-profit stewards of important botanical sites. They function two ways: (1) They bring people and interest to these sites (Appendix, List 2), and (2) they provide floristic surveys that help characterize the sites' botanical significance. A recent series of field trips (in 2017) to Bartram's Garden was organized to assist in development of a field guide produced at the garden for identification of nearby aquatic plants (Katz 2017).

Members of the Philadelphia Botanical Club have volunteered to provide lectures for local non-profit organizations such as the Wissahickon Restoration Volunteers. The Philadelphia Botanical club has provided financial support and publicity for botanical conferences, such as the Pennsylvania Botany Symposium.

GRANTS AND OTHER SUPPORT FOR STUDENTS AND AMATEURS

The Philadelphia Botanical Club annually awards grants in two programs for botanical research. The Bayard Long Award for Botanical Research provides financial support for students whose research is on plant species that are found in the Philadelphia region. A second grant program is for members—for projects related to botanical research, education and conservation. The Philadelphia Botanical Club has posted detailed information on its website about both these grants and how to apply for them.

INTEGRATION OF CITIZEN AND PROFESSIONAL SCIENCE

Many members of the Philadelphia Botanical Club are professionals with advanced degrees in botany or other scientific fields. Historically, senior officers of the club have held doctorates. Because their involvement with the organization is unpaid, their work in it meets the definition of citizen science. The Philadelphia Botanical Club is a catalyst that unites amateurs and professionals in pursuit of shared scientific interests. One of the most successful outcomes of the organization is the nurturing of amateurs into professionals who retain their role in citizen science, cultivating botanists of the next generation.

CONCLUSION

The Philadelphia Botanical Club is a local natural history organization run by volunteers. Collectively, the services it provides are critically important to the field of botany in Philadelphia. These services include:

- Support for original research in natural history.
- Publication of a peer-reviewed journal.
- Sponsorship of field trips including publication of field trip reports.

- Creation of a forum for presentation of local botanical research.
- Offers of educational opportunities in botany.
- Contributions to local and national botanical databases.
- Consultation for land management.
- Collaboration with other citizen science organizations.
- Support of non-profit institutions with shared interests.
- Grant support to students and others engaged in botanical research.

The Philadelphia Botanical Club is a citizen science organization that has made multifaceted contributions to science.

ACKNOWLEDGMENTS

We are grateful to Gerry Moore (USDA Plants) and Sasha Eisenman (Temple University) for their insightful comments on an earlier version of this manuscript.

LITERATURE CITED

- ANON. 1908. Officers and Members of the Philadelphia Botanical Club. *Bartonia* 1: 27–29
- ANON. 2011. 2009–2011 Membership list. *Bartonia* 65: 150–157
- BARNARD, E. S., P. W. MEYER, AND C. BRIGER. 2017. *Philadelphia Trees: A Field Guide to the City and the Surrounding Delaware Valley*. Columbia University Press, New York, New York.
- BROWN, S. 1908. A Brief History of the Philadelphia Botanical Club. *Bartonia* 1: 2–4.
- BROWN, S. J. CRAWFORD, AND W. STONE. 1908. Introductory. *Bartonia* 1: 1.
- CRALL, A. W. ET AL. 2010 Improving and integrating data on invasive species collected by citizen scientists. *Biological Invasions* 12(10): 3419–3428.
- DICKINSON J. L, ET AL. 2012 The current state of citizen science as a tool for ecological research and public engagement. *Frontiers in Ecology and the Environment* 10(6):291–297.
- DRAUDE, T. 2016. 26 July (Saturday): Native fern propagation workshop at the Morris Arboretum, PA. *Bartonia* 68:111.
- FOGG, JR., J. M. 1969. Bayard Long (1885–1969). *Bartonia* 39:1–6.
- FRANK, K. D. 2015. *Ecology of Center City, Philadelphia*. Fitler Square Press; Philadelphia, Pennsylvania.
- FRANK, K. AND D. HEWITT. 2014. Botanical Assessment of Fairmount Island. (In the archives of Philadelphia Parks and Recreation, in “David Hewitt” file); internet accessible by: <http://www.wagnerfreeinstitute.org/syllabi%202015-16/documents/BotanicalAssessmentofFairmountIsland.pdf>
- HOLMES, M. A. AND D. A. HEWITT. 2015. First record of *Magnolia grandiflora* L. as a casual alien in Pennsylvania. *Bartonia* 67: 84–85.
- JUELIG, G. R. 2007. Pinelands Preservation Alliance. *Journal of the Torrey Botanical Society* 134(1): 149–150.
- KELLER, I. AND S. BROWN. 1905. *Handbook of the Flora of Philadelphia and Vicinity*. Philadelphia Botanical Club, Philadelphia, Pennsylvania.
- MCCONNELL, S. 2014. *Witmer Stone: the Fascination of Nature*. Published by the author, New Jersey.
- MCKINLEY, D. C., A. J. MILLER-RUSHING, H. L. BALLARD, R. BONNEY, H. BROWN, D. M. EVANS, R. A. FRENCH, J. K. PARRISH, T. B. PHILLIPS, S. F. RYAN, L. A. SHANLEY, J. L. SHIRK, K. F. STEPENUCK, J. WELTZIN, A. WIGGINS, O. D. BOYLE, R. D. BRIGGS, S. F. CHAPIN III, D. A. HEWITT, P. W. PREUSS, AND M. A. SOUKUP. 2015. Investing in citizen science can improve natural resource management and environmental protection. *Issues in Ecology* 19:1–27.
- NOVAK, J. 2015. 03 August [2013]. p. 116. In 2012–2013 field trips. T. Gordon (ed.). *Bartonia* 67:92–122.

PENNELL, F. W. 1939. Arthur N. Leeds [obituary]. *Bartonia* 20: 30–32.

USDA PLANTS DATABASE. 2017a. Data Documentation: *Herniaria hirsuta* L. USDA NRCS National Plant Data Team. URL: <http://plants.usda.gov/java/reference?symbol=HEHI7> Accessed 3 June 2017

USDA PLANTS DATABASE. 2017b. Data Documentation: *Magnolia macrophylla* Michx. USDA NRCS National Plant Data Team. URL: <http://plants.usda.gov/java/reference?symbol=MAMA2> Accessed 3 June 2017

USDA PLANTS DATABASE. 2017c. Data Documentation: *Magnolia grandiflora* L. USDA NRCS National Plant Data Team. URL: <http://plants.usda.gov/java/reference?symbol=MAGR4> Accessed 3 June 2017

APPENDIX

Table 1. Schedule of meetings of the Philadelphia Botanical Club for the spring 2017.

Month	Topic	Speaker	Affiliation
January	Systematics and Evolution of the Grass Subfamily Arundinoideae, a Dustbin Taxon	Jordan Teisher	Academy of Natural Sciences of Drexel University, Department of Botany
February	Plants of Southern Europe: A Visit to the Apennines, Sardinia, and Northern Greece	Janet Novak	Independent; past president of the Philadelphia Botanical Club
March	Global Change Influences on Wetland Plant Invasions	Thomas J. Mozder	Bryn Mawr College, Department of Biology
April	The Beginnings of Botany in Michigan: From Thomas Nuttall (1810) to the Douglass Houghton Era (1830–1840)	Anton Reznicek	University of Michigan, Herbarium
May	<i>Trees of Philadelphia</i> (Newly published field guide)	Edward Barnard and Catriona Briger	Independent; coauthors <i>Trees of Philadelphia</i>

List 1. Publications of local (i.e, in counties within 50 miles of Philadelphia) floristic studies. All were published in *Bartonia*, the Journal of the Philadelphia Botanical Club.

1. BARTRAM, E. B. 1909 Noteworthy plants in the suburban district west of Philadelphia. *Bartonia* 2:10–14.
2. BARTRAM, E. B. 1913. Some noteworthy plants of Bear Swamp *Bartonia* 6:8–16.
3. MUMBAUER, J. R. 1913. Notes on the flora of upper Montgomery Co. *Bartonia* 6: 17–18.
4. LONG, B. 1924 Some changes in the aspect of the list of the Philadelphia Flora *Bartonia* 8: 12–32).
5. POHL, R. H. 1926 Notes on Pennsylvania and New Jersey grasses. *Bartonia* 24: 22–25.
6. LONG, B. 1927–1928. Some noteworthy indigenous species new to the Philadelphia area *Bartonia* 10: 30–52.
7. PENNELL, F. W. 1930 On some critical species of the Serpentine Barrens. *Bartonia* 12: 1–23.
8. BENNER, W. M. 1933 Additions to the Flora of Bucks County, Pennsylvania. *Bartonia* 15: 32–34.
9. BENNER, W. M. 1938–1939. Further additions to the Flora of Bucks County, Pennsylvania *Bartonia* 20: 25–26.
10. BENNER, W. M. 1942–1943. Additions to the Flora of Bucks County, Pennsylvania–III. *Bartonia* 22: 3–4.
11. DIX, W. L. 1942–1943. The Cladoniae of Pennsylvania. *Bartonia* 22: 32–62.
12. BUTLER, M.G. 1952–1953 A field trip to the New Jersey Pine Barrens *Bartonia* 29: 59–61.
13. ANON 1966. Summer Bloom: The Philadelphia Club field trip to the Pine Barrens, New Jersey, July 10th, 1966. *Bartonia* 36: 27.
14. CONSERVATION COMMITTEE OF THE PHILADELPHIA BOTANICAL CLUB 1957–1958. Local flora vandalism. *Bartonia* 29: 9.
15. CONSERVATION COMMITTEE OF THE PHILADELPHIA BOTANICAL CLUB 1963. More orchid vandalism in New Jersey. *Bartonia* 33: 12–13.
16. DIX, W. L. 1949 Supplementary Notes on the Cladoniae of Pennsylvania. *Bartonia* 25: 74–85.
17. FABLES JR., D. 1960–1961. Caesarian flora and fauna. *Bartonia* 30: 3–11.

18. FABLES JR., D. 1961–1962. Caesarian flora and fauna. *Bartonia* 32: 7–13.
19. DOLAN, T. 1965. The Penllyn Natural Area, Montgomery County, Pa. *Bartonia* No. 35: 10.
20. JAMES, R. L. 1965. The Schuylkill Valley Nature Center, Philadelphia County, Pa. *Bartonia* 35: 11.
21. ROBERTSON, M. R. 1965. The Pine Barrens in Autumn: The Philadelphia Botanical Club field trip to Batsto, New Jersey, October 31, 1965. *Bartonia* 35: 20.
22. ANON. 1966. "In Torrey's Footsteps" The Philadelphia Botanical Club field trip to the Pine Barrens, June 5th, 1966 *Bartonia* 36: 26.
23. KOELNEAU, L. 1969. The effect of urban conditions on the trees in the vicinity of Logan Circle. *Bartonia* 39:12–15.
24. GOOD, R. E. AND N. F. GOOD, 1974–1975. Vegetation and production of the Woodbury Creek-Hessian Run freshwater tidal marshes. *Bartonia* 43: 38–45.
25. FERREN, JR., W. R. 1975–1976. Aspects of the intertidal zones, vegetation, and flora of the Maurice River system, New Jersey. *Bartonia* 44: 58–67.
26. NEWBOLD, A. 1975–1976. The flora of Sunrise Mill Park, Montgomery County, Pennsylvania. *Bartonia* No. 44: 32–36.
27. PEARSON, JR., P. 1975–1976. Arborescent composition of woodlands on diabase in Bucks and Montgomery Counties, Pennsylvania. *Bartonia* 44:1–7.
28. NEWBOLD, A. 1978. Additions to the check-list of the flora of Montgomery County. *Bartonia* 45: 5.
29. NEWBOLD, A. 1978. Additions to the flora of Sunrise Mill Park, Montgomery County, Pennsylvania. *Bartonia* No 45: 15–17
30. ABRAITYS, V. 1980. A check-list of the flora of Hunterdon County, New Jersey. *Bartonia* 47:23–30.
31. NEWBOLD, A. 1979. Additions to the check-list of the flora of Montgomery County, II *Bartonia* 46: 49–50.
32. PEARSON, JR., P. R. 1979. Vegetation reconnaissance of three woodland stands on Buckingham Mountain, Bucks County, Pennsylvania. *Bartonia* 46: 71–80
33. MCCABE, M. AND A. NEWBOLD. 1980. Additions to the check-list of the flora of Montgomery County, III. *Bartonia* 47: 36.
34. SCHUYLER, A. E. 1980. Five Mile Woods (Bucks County, Pennsylvania) revisited *Bartonia* 47: 21–22)
35. ABRAITYS, V. 1981. Additions to the flora of Hunterdon County, New Jersey. *Bartonia* 48:11.
36. FERREN, JR., W., R. E. GOOD, R. WALKER AND J. ARSENAULT. 1981. Vegetation and flora of Hog Island, a brackish wetland in the Mullica River, New Jersey. *Bartonia* No. 48: 1–10.
37. MCCABE, M. F. 1983. Viewing plants through the seasons in upper Perkiomen Valley Park (Montgomery County, Pennsylvania). *Bartonia* 49: 55–58.
38. HIRST, F. 1983. Field Report on the Delmarva Flora, I. *Bartonia* 49: 59–68.
39. BOERNER, R. E. J. AND T. R. LORD. 1984. First-year loss of mass and nutrients from leaf litter in the New Jersey Pine Barrens. *Bartonia* 50: 12–20.
40. NACZI, R. F. C. 1984. Rare sedges discovered and rediscovered in Delaware. *Bartonia* 50:31–35
41. MONTGOMERY, J. D. AND D. E. FAIRBROTHERS. 1985. Geographical distribution of New Jersey's Pteridophytes. *Bartonia* 51:52–57.
42. MORRISEY, W. 1985. Pteridophytes of Monmouth County, New Jersey. *Bartonia* No. 51:46–51.
43. OVERLEASE, W. R. 1985 New plant records for Chester County, Pennsylvania –1982–1984. *Bartonia* 51: 93–94.
44. SEISCHAB, F. K. AND J. M. BERNARD. 1985. Early plant succession on marl beds in the Byron-Bergen Swamp. *Bartonia* 51: 58–64.

45. NEWBOLD, A. AND R. J. HOLT. 1986. Additions to the check-list of the flora of Montgomery County, IV. *Bartonia* 52: 78.
46. OVERLEASE, W. R. 1986. Checklist of the flora of Chester County, Pennsylvania. *Bartonia* 52: 60–77.
47. OVERLEASE, W. R. 1987. 150 Years of vegetation change in Chester County, Pennsylvania *Bartonia* 53: 1–12.
48. LECK, M. A., R. L. SIMPSON, D. F. WHIGHAM AND C. F. LECK. 1988. Plants of the Hamilton Marshes: A Delaware River freshwater tidal wetland. *Bartonia*: 54: 1–17.
49. RUSSELL, E. W. B., AND A. E. SCHUYLER. 1988. Vegetation and flora of Hopewell Furnace National Historic Site, eastern Pennsylvania. *Bartonia* 54: 124–143.
50. SCHUYLER, A. E. 1989. Submerged vascular plants in the Delaware River from the Delaware Water Gap to Trenton. *Bartonia* 55: 53–58.
51. CLANCY, K. 1993. Selected rare and historical vascular plants of Delaware. *Bartonia* 57: 75–92.
52. LATHAM, R. E. 1993. The serpentine barrens of temperate Eastern North America: critical issues in the management of rare species and communities. *Bartonia* 57: 61–74.
53. HECKSCHER, S. 1994. The vegetation of the Glades Region, Cumberland County, New Jersey. *Bartonia* 58: 101–113.
54. LATHROP, JR., R. G. 1994. Satellite remote sensing of Pinelands ecosystems. *Bartonia* 58: 1–9.
55. KARLIN, E. F. 1994. Mosses of the New Jersey Pine Barrens and adjacent coastal plain *Bartonia* 58:11–21.
56. FOGG, JR., J. M. 1996 Annotated checklist of the plants of the Wissahickon Valley. *Bartonia* 59: 1–36.
57. MELLON, R. 1996. Soil Chemistry data for species of special concern in Pennsylvania. *Bartonia* 59: 97–106.
58. MCAVOY, W. M. 2000. Noteworthy native plant collections from the Delmarva Peninsula. *Bartonia* 60: 23–36.
59. MCAVOY, W. A. AND P. BOWMAN. 2002. The flora of coastal plain pond herbaceous communities on the Delmarva Peninsula. *Bartonia* 61:81–91.
60. SCHUYLER, A. E. AND T. GORDON. 2002. Rare plants in the middle branch of the Forked River watershed, Lacey Township, Ocean County, New Jersey. *Bartonia* 61: 117–121
61. LATHAM, R. AND A. F. RHOADS. 2006. The historical flora of Wykers Island in the Delaware River, Bucks County, Pennsylvania, from the 1884 to 1887 botanical notes of John and Harvey Ruth. *Bartonia* 63:29–47.
62. BIEN, W. F., J. R. SPOTILA AND T. GORDON. 2009. Distribution trends of rare plants at the Warren Grove Gunnery Range. *Bartonia* 64:1–18.
63. BARRINGER, K. 2011. A preliminary catalog of New Jersey hornworts and liverworts. *Bartonia* 65: 2–19.
64. OVERLEASE, W. AND E. OVERLEASE 2011. Long-term observations of plant succession on an abandoned cornfield in southern Chester County, Pennsylvania, (1967–2000). *Bartonia* 65: 97–104.
65. KELLY, J. F. 2013. The status and distribution of *Amaranthus pumilus* Raf. (Seabeach Amaranth) and other rare beach plant species in New Jersey: Field surveys and historical records. *Bartonia* 66:28–60.
66. HOLMES, M. A. AND D. A. HEWITT. 2015. First record of *Magnolia grandiflora* L. as a casual alien in Pennsylvania. *Bartonia* 67: 84–85.
67. POSTER, L. S., J. S. PRINGLE AND L. STRUWE 2015. Identification and descriptions of the Gentianaceae in New Jersey. *Bartonia* 67:1–34.
68. BRAXTON, J. W. AND W. R. FERREN, JR. 2016. The vascular plants of Camp Dark Waters, Medford, New Jersey, 1912–2015. *Bartonia* 69: 77–89

69. CHMIELEWSKI, J. G., D. M. KRAYESKY AND S. D. LOTZ. 2016. New Pennsylvania County occurrences for *Cardamine impatiens*, *Geranium dissectum*, *Lamium galeobdolon*, *Lathyrus latifolius* and *Rosa gallica*. *Bartonia* 68:86–88.
70. GORDON, T. AND J. ARSENAULT. 2016. Flora of Burden Hill Forest: a checklist for a Salem County Landscape. *Bartonia* 69:20–46.
71. LONGBOTTOM, L. W., R. F. C. NACZI, AND W. M. KNAPP. 2016. Flowering plant species new to Delaware and Maryland. *Bartonia* 69: 1–2.
72. MOORE, G. 2016. An overview of scientific names honoring the City of Philadelphia, with emphasis on flowering plants. *Bartonia* 69: 90–117.

List 2. Published reports of field trips of the Philadelphia Botanical Club (Each report includes a list of plants observed, unless noted otherwise).

1977 Field Trips

Bartonia No. 46, 1979, (pp. 86–87):

1. Spring Mount and Perkiomen Creek, Montgomery County, PA,
2. Fraziers Bog, Montgomery County, PA
3. Bridgeton, including Cohansy River and Fairton, Cumberland County, NJ
4. Brigantine Island, Atlantic County, NJ
5. Nockamixon Narrows, Bucks County, PA
6. University Camp, Green Lane, Montgomery County, PA

1978 Field Trips

Bartonia No. 46, 1979 (pp 88–89)

7. Doe Mountain, Longswamp Township, Berks County, PA
8. Fellowship Farm and Sanatoga Road stations, Montgomery County, PA
9. Albion, Camden County, NJ
10. East of Deans and Dayton, and near village of Helmetta, Middlesex County, NJ
11. Mont Clare-Phoenixville, area, Chester County, PA
12. New Egypt, including Pine Barrens, Ocean County, NJ

1979 Field Trips

Bartonia No. 47, 1980 (pp 43–44)

13. Skunk Hollow, Radnor Twp., Delaware Co., PA
14. Willow Oak Nature Area and Marsh River, Vineland, New Jersey
15. Mertztown, Berks Co., PA
16. New Jersey pine barrens
17. Tyler Arboretum, Nottingham barrens, and Longwood Gardens, Delaware and Chester Counties, PA
18. Tidal marshes near Salem, Woodbury, and Manahawkin, NJ
19. Glen Flora Pond Preserve, Montgomery Co., PA
20. Stafford Forge, Ocean Co., NJ.

1980 Field Trips

Bartonia No 48, 1981 (pp 49–51)

21. Tyler Arboretum, Lima, Delaware Co., PA
22. Tyler Arboretum, Pink Hill, Lima, Delaware Co., PA
23. Sunrise Mill Park, Limerick, Montgomery Co., PA
24. Woodford Property, Cedar Run Lake, Medford, Burlington Co., NJ
25. Mt. Mansfield and Smuggler's Notch, VT
26. Lake Champlain shores, VT
27. Stafford Forge, Eagleswood Township, Ocean Co., NJ
28. French Creek State Park, Warwick, Chester Co., PA
29. Brigantine Beach, Atlantic Co., NJ
30. Flora of coastal ponds, Monmouth and Ocean counties, NJ

1981 Field Trips

Bartonia No. 49, 1983 (pp. 74–75)

31. Brandywine Area of Chester Co., PA
32. Fortescue Glades Wildlife Refuge, Cumberland Co., NJ
33. Sumneytown, Salford Township, Montgomery Co., PA
34. Silver Lake Nature Center, Bristol, Bucks Co., PA
35. Tyler Arboretum, Lima, Delaware Co., PA
36. Mannington Marsh, Salem Co., NJ
37. Sylvan Lake in Avon-by-the Sea, Old Sam's Pond in Point Pleasant Beach, Monmouth and Ocean counties, NJ

1982 Field Trips

Bartonia No 50, 1984 (pp. 66–69)

38. Tyler Arboretum, Lima, Delaware Co., PA
39. Stiles Estate, Mt. Bethel, Northampton Co., PA
40. Fronheiser Estate off Weinsteiger Road, Washington Township, Bechtelsville, Berks County, PA
41. Nolde Forest State Park, Reading, PA
42. Vineland, Cumberland Co., NJ
43. Lower Bear and Upper Bear Islands, Susquehanna River, Lancaster Co., PA
44. Bear Swamp West, Cumberland Co., NJ
45. Ridley Creek State Park, Delaware Co., PA
46. Gleave L. Baker Park, Baltimore Pike, Media, Delaware Co., PA
47. St. Peter's Village, Chester Co., PA
48. Willisbrook Meadow Wild Life Reserve, Willisbrook Township, Chester Co., PA
49. Swartswood Lake, NJ
50. Bulls Island, Hunterdon Co., NJ
51. Clark's Landing, Mullica River, Atlantic Co., NJ
52. Tinicum National Environmental Center, Philadelphia, PA

1983 Field trips

Bartonia No 50, 1984 (pp. 69–72)

53. Tyler Arboretum, Lima, PA
54. Lebanon State Forest, NJ
55. Tyler Arboretum and Paoli, PA
56. Goat Hill Serpentine Barrens, West Nottingham Township, Chester Co., PA
57. Bear Swamp East, Cumberland Co., NJ
58. Jenny Jump State Park and Johnsonburg, NJ
59. Mullica River (Batsto, Crowley's Landing, Green Bank, Lower Bank, Turtle Creek Road, in the Swan Bay Wildlife Management Area, Port Republic) Burlington and Atlantic counties, NJ
60. Whitehouse, Somerset Co., NJ
61. Iona Island Marsh, Rockland Co., NY
62. Great Bay Wildlife Management area and Lake Pohatcong, Tuckerton, NJ

1984 Field Trips

Bartonia, No. 51, 1985 (pp. 116–120)

63. The Plains, Lebanon State Forest Area, NJ
64. Kimberton Area, Chester Co., PA
65. Tyler Arboretum, Lima, Delaware Co., PA
66. Ridley Creek State Park, Delaware Co., PA
67. Upper Perkiomen Park, Montgomery Co., PA
68. Mason Run, Gloucester Township, Camden Co., NJ
69. Chincoteague Wildlife Refuge on Assateague Island, VA
70. Nassawango Preserve and Milburn Landing Area, Pocomoke State Park, south of Salisbury, MD
71. Bennett's Mill, Cumberland Co., NJ
72. Piermont Marsh, Rockland Co., NY
73. Rancocas Nature Center, Westampton, Burlington Co., NJ
74. Oak Island, New Gretna Area, Ocean Co., NJ
75. Ridley Creek State Park, Delaware Co., PA

1985 Field Trips

Bartonia, No. 52, 1986 (pp. 86–88)

76. Wissahickon Creek, Fairmount Park, Philadelphia Co., PA
77. Tinicum Environmental Center, 86th Street and Lindbergh Boulevard, Philadelphia Co., PA
78. Big Elk Creek, Chester Co., PA
79. Huff's Church, Berks Co., PA
80. New Lisbon, Pemberton Township, Burlington Co., NJ
81. Martha Furnace Area, Burlington Co., NJ
82. Bear Swamp West, Cumberland Co., NJ
83. West of Bridgeport, and Worcester Township, Montgomery Co., PA
84. Rancocas Nature Center, Westampton, Burlington Co., NJ

85. Atsion and vicinity, Burlington and Atlantic counties, NJ
86. Wading River tidal marsh, Wading River, NJ
87. Upper Perkiomen Park, Green Lane, Montgomery Co., PA

1986 Field Trips

Bartonia, No. 53, 1987 (pp. 66–71)

88. Big Elk Creek, Chester Co., PA
89. Smedley Park, Media, Delaware Co., PA
90. Lebanon State Forest, Burlington Co., N
91. Bowman's Hill Wildflower Preserve, New Hope, Bucks Co., PA
92. Watchung Mountains, Somerset Co., NJ
93. Batsto and Pleasant Mills, Burlington and Atlantic counties, NJ
94. Craven Estate, Salford Township, Montgomery Co., PA
95. Upper Perkiomen Park, Green Lane, Montgomery Co., PA
96. Bear Swamp West, Cumberland Co., NJ
97. Roebling Park, Crosswicks Creek, Hamilton Township, Mercer Co., NJ
98. Lebanon State Forest, Burlington Co., NJ
99. Delhaas Woods, Bristol Township, Bucks Co., PA
100. Intermittent Ponds, Egg Harbor City vicinity, Atlantic Co., NJ
101. Mason Run, Gloucester Township, Camden Co., NJ
102. Bowman's Hill Wildflower Preserve, New Hope, Bucks Co., PA
103. Clayton Park, Delaware Co., PA
104. Beaver Creek and Ringing Rock Park, Upper Bucks Co., PA

1987 Field Trips

Bartonia No. 54, 1988 (pp. 151–154)

105. Big Elk Creek, Chester Co., PA
106. Awbury Arboretum, Philadelphia, PA
107. Crossley Preserve, Manchester & Berkeley twps., Ocean Co., NJ
108. Lebanon State Forest, Burlington Co., NJ
109. Pennypack Watershed Association Wilderness Park, Bryn Athyn Borough and Lower Moreland Township, Montgomery Co., PA
110. Whitehouse Station, Hunterdon Co., NJ
111. Whittingham Wildlife Management Area, Sussex Co., and Johnsonburg, Warren Co., NJ
112. Atco, Camden Co., NJ
113. Johnsonburg, Warren Co., NJ
114. Smedley Park, Delaware Co., PA
115. Hopewell Furnace National Historic Site, Berks Co., PA

1988 Field Trips

Bartonia No. 55 1989 (pp. 63–67)

116. Plains of Burlington and Ocean Counties, NJ. (Coyle Airfield, Warren Grove, Watering Place Pond)

117. Fern Hill Serpentine Barrens, Chester Co., PA
118. White Clay Creek Natural Area, Chester Co., PA, and New Castle Co., DE
119. John and Beth Mitchell property, Delaware Township, Hunterdon Co., NJ
120. Bowman's Hill State Wildflower Preserve, Bucks Co., PA
121. Tinicum National Environmental Center, Philadelphia, Co., PA
122. Manumuskin River and Cumberland Furnace, Cumberland Co., NJ
123. Cape May State Park and Bennett's Bog, Cape May Co., NJ
124. Clark's Pond/Dix Wildlife Refuge, Fairfield Township, Cumberland Co., NJ
125. Pennsylvania State Game Lands 141, Hughes Swamp, Carbon Co., PA
126. Double Trouble State Forest, Ocean Co., NJ
127. Makepiece Lake and Vicinity, Atlantic Co., NJ
128. Warren Grove environs, Ocean and Burlington counties, NJ
129. Malaga Road Gravel Pit, Monroe Township, Gloucester Co., NJ

1989 Field Trips

Bartonia No. 56 1990, (pp. 72–78)

130. Shaws Mill Pond/Bear Swamp West, Cumberland Co., NJ
131. Doe Mountain Ski Area, Montgomery Co., PA
132. Bowman's Hill Wildflower Preserve, Bucks Co., PA.
133. Stratford Marls, Camden Co., NJ
134. Riddleton, Salem Co., NJ
135. Tuckahoe River Area, Atlantic, Cape May, Cumberland Cos., NJ
136. Tulpehauken Creek at Hawkins Bridge, Wharton State Forest, Burlington Co., NJ
137. Tyler Arboretum, Lima, Delaware Co., PA
138. Oceanville Bog, Atlantic Co., and New Gretna environs, Burlington Co., NJ
139. Manumuskin River, Cumberland Co., NJ. (Bennetts Mill; Forge Pond)
140. Goose Ponds, Egg Harbor, Atlantic Co., NJ
141. Colliers Mill Fish and Wildlife Management Area, Ocean Co., NJ
142. Rancocas Nature Center and Mill Creek Park, Burlington Co., NJ
143. Bennett Bog, Cape May Co., NJ
144. Bogs of Wells Mill and Forked River environs, Ocean Co., NJ
145. Stafford Forge, Eagleswood Township, Ocean Co., NJ
146. Tinicum National Environmental Center, Philadelphia Co., PA
147. Tuckahoe River/West Creek, Atlantic, Cape May, Cumberland Counties, NJ.
(West Creek Baptist Cemetery)

1990 Field Trips

Bartonia No. 57, 1991 (pp 107–112)

148. Tyler Arboretum, Lima, Delaware Co., PA
149. Mt. Cuba, New Castle Co., DE
150. Forked River, Ocean Co., NJ
151. Perkiomen Creek at Spring Mount, Montgomery Co., PA
152. Atsion, Burlington Co., NJ
153. Snowshoe, WV

- 154. Clementon and Vicinity, Camden Co., NJ
- 155. Miller Bogs at Dutchtown, Atlantic Co., NJ
- 156. Pecks Pond and Little Mud Pond, Pike Co., PA
- 157. Bushkill Shale Cliffs, Pike Co., PA
- 158. Lower Maurice River, Cumberland Co., NJ
- 159. Great Bay Wildlife Management Area, Ocean Co., NJ
- 160. Bennet Bogs Nature Preserve, Cape May Co., NJ
- 161. Hamilton/Trenton Marsh, Mercer Co., NJ
- 162. Atsion Lake, Burlington Co., NJ

1991 Field Trips

Bartonia No. 58, 1994, (pp. 72–78)

- 163. Pine Barrens of Burlington and Ocean Counties, NJ
- 164. Mount Cydonia Ponds and Mountain Run Ponds, Franklin Co., PA
- 165. Licking Creek, Franklin Co., PA
- 166. Bowman's Hill State Wildflower Preserve, Bucks Co., PA
- 167. Oswego River, Burlington Co., NJ
- 168. Palmyra, Burlington Co., NJ
- 169. Tuckahoe River/Belleplain State Forest, Atlantic, Cape May, Cumberland Counties, NJ
- 170. Paulinskill Creek area and Stokes State Forest, Sussex Co., NJ
- 171. Mad Horse Creek Fish and Wildlife Management Area, Lower Alloway Creek Township, Salem Co., NJ
- 172. Bennett Bogs Preserve, Lower Township, Cape May Co., NJ
- 173. Delaware River tidal wetlands, New Castle Co., DE
- 174. New Lisbon, Whitesbog, and Lebanon State Forest, Burlington and Ocean Counties, NJ. (Mt. Misery Brook in New Lisbon)
- 175. Trenton/Hamilton Marshes, Mercer Co., NJ (Sturgeon Pond, Watson's Creek near Roebling Park)
- 176. Sandy Hook National Recreation Area, Monmouth Co., NJ
- 177. Presque Isle State Park, Erie Co., PA
- 178. Cumberland and Cape May Counties, NJ

1992 Field Trips

Bartonia No. 58, 1994 (pp. 148–154)

- 179. Lebanon State Forest, Burlington Co., NJ
- 180. Shenk's Ferry and Susquehanna River Glens, Lancaster Co., PA
- 181. Inner Coastal Plain at Vincentown and Pine Barrens, Burlington Co., NJ. (South Branch of Rancocas Creek; Hatcher Farm)
- 182. Salem and Cumberland Counties, NJ. (Salem Creek near Woodstow)
- 183. Bowman's Hill Wildflower Preserve, Bucks Co., PA
- 184. Wissahickon Valley, Philadelphia Co., PA
- 185. Iron Hill, New Castle Co., DE
- 186. Oswego River Savannah and Turfcut, Burlington Co., NJ

187. Manumuskin River, Muskee Creek, and Tuckahoe River; Atlantic, Cape May, and Cumberland Counties, NJ
188. Whitesbog and Vicinity, Ocean and Burlington Counties, NJ
189. Goat Hill Serpentine Barrens, Chester Co., PA
190. Lehigh Pond, Wayne Co., PA. (Tobyhanna State Park; State Game Lands No. 127)
191. Hutcheson Memorial Forest, Somerset Co., NJ
192. Cecil, Gloucester Co., NJ. (Monroe and Franklin Townships, Blue Bell Road between Malaga Road and Coles Mill Road; Arrowwood Nursery; Winslow Fish and Wildlife Management Area)
193. Craven's Estate, Natural Lands Trust, near Sumneytown, Montgomery Co., PA. ("Potato Patch," Ringing Rocks)

1993 Field Trips

Bartonia No. 59, 1996 (pp. 138–142)

194. Furnace Hills, Lancaster Co., PA
195. Woodlands Cemetery, 40th St. and Woodland Avenue, Philadelphia, PA
196. Muskee Creek, Manumuskin River, Tuckahoe River, Pine Barrens of Atlantic and Cumberland Counties, NJ
197. Nockamixon State Park and Haycock Mountain, Bucks Co., PA
198. Pennypacker Mills Co. Park, Schwenksville, Montgomery Co., PA
199. Tyler Arboretum, Lima, Delaware Co., PA
200. Green Acres Natural Area, Medford Leas, Burlington Co., NJ
201. Smithville Mansion; Rancocas Nature Center in Westhampton; Smithville Lake in Easthampton Township, Burlington Co., NJ
202. Batsto River; Penn Swamp Branch west of the Tuckerton Trail, Burlington Co., NJ
203. Sandy Branch, New Castle Co., DE
204. Long Savanna, Batsto River, Burlington Co. and Route 30, Atlantic Co., NJ
205. Washington Park, Washington Township, Gloucester Co., NJ

1994 Field Trips

Bartonia No. 59, 1996 (pp. 143–146)

206. Fern Hill Farm, Gloucester Co., NJ
207. Williamson Park and Shenk's Ferry, Lancaster Co., PA
208. Atsion and Penn Swamp Branch (= Goodwater Run, a small Batsto tributary southeast of Quaker Bridge), Wharton State Forest, Burlington Co., NJ
209. Taylor's Preserve, Cinnaminson, Burlington Co., NJ
210. Millersburg, Dauphin Co., PA
211. Malaga Lake; Brotmanville, near Maurice River, north of Garden Road, Franklin Township, Gloucester Co., and Upper Pittsgrove, Salem Co., NJ
212. Montauk Point, Long Island, NY
213. Martha Furnace and Oswego River, Burlington Co., NJ
214. Chesapeake and Delaware Canal, New Castle Co., DE

1995 Field Trips

Bartonia No. 60, 2000 (pp. 128–129)

- 215. Warren Grove, Burlington and Ocean Counties, NJ
- 216. Savanna near Oswego Lake, Burlington Co., NJ
- 217. Taylor's Preserve, Cinnaminson, Burlington Co., NJ
- 218. St. Peters to Warwick (Horseshoe Trail, Trythall Rd.) Chester Co., PA

1996 Field Trips

Bartonia No. 60, 2000 (pp. 130–133)

- 219. Pocono Environmental Education Center, Pike and Monroe Counties, PA.
(Tumbling Waters Ravine, Hornbecks Ravine, Dingmans Falls, Hogback Ridge near Bushkill)
- 220. Atsion/Quaker Bridge area of the Mullica and Batsto Rivers, Burlington Co., NJ
- 221. High Point State Park, Sussex Co., NJ
- 222. Long Pond Preserve, Monroe Co., PA
- 223. Inskips, Winslow Twp., Camden Co., NJ
- 224. Lebanon State Forest and Route 563, Pakim Pond, Burlington Co., NJ
- 225. Oswego River, Pinelands of Burlington Co., NJ

1997 Field Trips

Bartonia 61, 2002 (pp. 155–162)

- 226. Valley Forge National Historic Park, PA
- 227. Bowman's Hill Wildflower Preserve, Bucks Co., PA
- 228. Funks Pond Recreational Area north of the Conowingo Dam, Cecil Co., MD
- 229. Sadsbury Woods, Chester Co., PA
- 230. Shenandoah National Park, VA
- 231. Bulls Island and Prallsville Mills, Hunterdon Co., NJ
- 232. Bear Swamp West, Downe Township, Cumberland Co., NJ
- 233. Whitesbog, Lebanon State Forest, Burlington and Ocean Counties, NJ
- 234. Atsion, Dutchtown, Parkdale, Hampton Furnace in Wharton State Forest, Burlington and Atlantic Counties, NJ
- 235. Lobachsville, Berks Co., PA
- 236. Atsion Ranger Station, Wharton State Forest, Oswego River, Burlington Co., NJ
- 237. Hawk Island, Delanco Township, Burlington Co., NJ
- 238. Hamilton and Trenton Marshes, Duck Island Mitigation Site, Mercer Co., NJ.
(Mercer Co. Public Boat Launching Area, Lamberton Road, and Delaware River)
- 239. Central Perkiomen Valley Park, Montgomery Co., PA
- 240. Lakehurst area, Pine Barrens, Ocean Co., NJ
- 241. Pasadena along the Pasadena-Woodmansie Road, Webbs Mill, Route 539 to the Lower Plains, NJ

1998 Field Trips

Bartonia 61, 2002 (pp 163–167)

- 242. Forsythe National Wildlife Preserve, Manahawkin Section, Ocean Co., NJ
- 243. Clayton Park, Upper Freehold Township, Monmouth Co., NJ
- 244. Goat Hill Preserve, Chester Co., PA
- 245. Meng Preserve, Montgomery Co., PA
- 246. Island Beach State Park, Ocean Co., NJ
- 247. Bennetts Mill and Vicinity, Peasle Fish and Wildlife Management Area, City of Vineland and Maurice River Township, Cumberland Co., NJ
- 248. Barkwoods Pond, Hirst Pond, Goose Ponds, Egg Harbor City vicinity, Atlantic Co., NJ
- 249. Atsion and vicinity, Burlington Co., NJ

1999 Field Trips

Bartonia 61, 2002 (pp. 167–173)

- 250. Lebanon State Forest, Onga's Hat, Buffin Meadows, Burlington Co., NJ. (Cedar Swamp Natural Area, Bear Hole, Buffin Meadows)
- 251. Sourland Mountain Preserve, Hillsborough Township, Somerset Co., NJ
- 252. Greater Forked River Mountains region, Ocean and Lacey Townships, Ocean Co., NJ. (Cold Brook, Wells Mills), Sprague Branch, North Branch of Forked River)
- 253. Adkins Arboretum, Caroline Co., MD
- 254. Malaga, Franklin Township, Gloucester Co., NJ
- 255. Pocono Environmental Education Center, PA (Hogback Ridge in Pike and Monroe counties, PA)
- 256. Middle and South Branches of the Forked River, Lacey Township, Ocean Co., NJ
- 257. Whiting and Whitesbog, Lebanon State Forest, Ocean and Burlington Counties, NJ
- 258. Whittingham Wildlife Management Area, Fredon Township, Sussex Co., NJ
- 259. Palmyra Cove Nature Park, Palmyra, Burlington Co., NJ. (Delaware River, Pennsauken Creek, Route 73)
- 260. Cedar Lake Fish and Wildlife Management Area, Monroe Township, Gloucester Co., and Buena Township, Atlantic Co., NJ
- 261. Roebling Memorial Park and Duck Island of the Hamilton-Trenton Marsh, Mercer Co., NJ

2000 Field Trips

Bartonia 62, 2004 (pp 113–118)

- 262. Bowman's Hill Wildflower Preserve, Bucks Co., PA
- 263. Pine Barrens of Atsion and vicinity, Burlington Co., NJ
- 264. Lonely Road Meadow, Sellersville, Buck Co., PA
- 265. Tacony Creek Park, Philadelphia Co., PA

- 266. Pleasant Mills and Batsto, Wharton State Forest, Atlantic and Burlington Counties, NJ. (Nescochague Bog, West Mill Road)
- 267. Old Mine Road, Sussex and Warren Counties, NJ
- 268. Hog Wallow, Rutgers Experimental Station, and Buck Run Vicinity, Burlington Co., NJ. (Route 563 between Hog Wallow and Pineworth; Phillip E. Marucci Cranberry/Blueberry Research Center on Oswego Lake Road [= Penn Place Road], Harrisville in the Wharton State Forest, Martha Furnace, Buck Run)
- 269. McCarthy's Lake, Franklin Township, Gloucester Co. and Cedar Lake, Buena Vista Township, Atlantic Co., NJ
- 270. Bowman's Hill Wildflower Preserve, Bucks Co., PA
- 271. Great Bay Wildlife Management Area, Ocean Co., NJ. (Tip Seaman Co. Park in Tuckerton, Great Bay)
- 272. Monmouth Co., NJ. (Howell Township, Louise Drive, Shark River Station, Manasquan Reservoir.

2001 Field Trips

Bartonia 62, 2004 (pp 118–124)

- 273. Nockamixon State Park, Bucks Co., PA
- 274. Menantico and Peaslee Wildlife Management Areas, Cumberland Co., NJ
- 275. Fairmount Park, southwest of the Recycling Center and southwest of Chamounix Mansion Philadelphia Co., PA
- 276. Miller Farm, Chester Co., PA
- 277. Pancake Turf cut near Waretown and Lochiel Creek near Barnegat, Ocean Co., NJ
- 278. Atsion, Burlington Co. and Rockwood-West Mill Tract of Wharton State Forest, Atlantic Co., NJ
- 279. Stafford Forge Wildlife Management Area, Ocean Co., NJ
- 280. Thompson Park, Jamesbury, Middlesex Co., NJ
- 281. Maurice River Cove and Delaware Bay, Cumberland Co., NJ. (Thompsons Beach Road, Bivalve, Hansey Creek Road)

2002 Field Trips

Bartonia 62, 2004 (pp 124–128)

- 282. Martha Furnace and Oswego River Savannas, Wharton State Forest, Burlington Co., NJ. (Oswego River, Calico Ridge, Cutts Pumphouse, Buck Run Savanna)
- 283. Nescopeck State Park, Luzerne Co., PA. (Mt. Yaeger)
- 284. Decou Pond (= Deacon Pond), and Sykes Branch, Woodland Township, Burlington Co., NJ; Micajas and Hidden Ponds, Stafford Township, Ocean Co., NJ. (West Plains Natural Area, Long Branch of Cedar Run, Hidden Pond)
- 285. Ker-Feal (country home of Albert and Laura Barnes), West Pikeland Township, Chester Co., PA.
- 286. Brandywine Conservancy, PA.
- 287. Maurice River Watershed and Delaware Bay, Cumberland Co., NJ. (Menantico Ponds Wildlife Management Area, Orange Street, Millville Industrial Park;

Menantico Creek, Route 47, Brickboro, Hansey Creek Road, Thompson Beach, Moores Beach)

288. Jenkins Arboretum, Chester Co., PA

2003 Field Trips

Bartonia 63, 2006 (pp 53–59)

- 289. Bear Swamp, Downe Township, Cumberland Co., NJ. (Shaws Mill, Dividing Creek Station and Whitehead Station, Hansey Creek and Turkey Point)
- 290. Delaware Water Gap National Recreation Area, Pike and Monroe Counties, PA.
- 291. F. M. Mooberry's Garden, East Marlborough Township, Chester Co., PA [No data.]
- 292. Whites Mill tract, Salford Township, Montgomery Co., PA. (Ridge Valley Creek)
- 293. Big Elk Creek, Chester Co., PA
- 294. Island Beach State Park, Ocean Co., NJ [No data]
- 295. Oswego Lake Savanna, Burlington Co., NJ
- 296. Nescopeck State Park, Luzerne Co., PA
- 297. Egg Harbor City ponds, Atlantic Co., NJ [No data]
- 298. Mill Creek, Willingboro, Burlington Co., NJ. (Rancocas Creek, Taylor's Preserve in Cinnaminson)
- 299. Supawna Meadows National Wildlife Refuge, Salem Co., NJ. (Xmas Tree Lane, Elsinboro Point, Delaware Bay)
- 300. Palmyra Cove Nature Park, Palmyra, Burlington Co., NJ. (Delaware River, Pennsauken Creek and Route 73)
- 301. Lower (East) Pine Plains and adjacent Oswego River Savannas within the Air National Guard Range south of Warren Grove, Burlington Co., NJ
- 302. Hamilton-Trenton Marsh, Duck Island created wetland, Mercer Co., NJ. (Roebling Park / Spring Lake; Delaware River; Mercer Co. boat launch; Beaver Point)
- 303. Delaware Water Gap National Recreation Area, Pike and Monroe Counties, PA, and Sussex Co., NJ (Pocono Environmental Education Center)
- 304. Bear Swamp, Downe Township, Cumberland Co., NJ

2004 Field Trips

Bartonia No. 63, 2006 (pp. 59–67)

- 305. Burden Hill Forest, Quinton and Alloway Townships, Salem Co., NJ. (Burden Hill Forest, Cohansey Formation, Kirkwood and Bridgeton Formations, Inner Coastal Plain; Telegraph Road, Cool Run; Old Stage Road, Route 49, Cohansey-Pecks Corner Road)
- 306. Laurels Reserve, Newlin Township, Chester Co., PA. (Laurels Preserve, a Brandywine Conservancy property, King Ranch)
- 307. Allaire State Park, Howell and Wall Townships, Monmouth Co., NJ
- 308. Thompson Park, Middletown, Monmouth Co., NJ [No data]
- 309. Intermittent Hampton-Central Ponds, Wharton State Forest, Burlington Co., NJ. (Carranza Road, Hampton Gate, High Crossing Road, Hampton Furnace Jersey Central Railroad, South Pond)

310. Franklin Parker Preserve, Chatsworth, Burlington Co., NJ [No data]
311. Fairfield, Greenwich, and Stow Creek Townships, Cumberland Co., NJ. (Springtown, Greenwich Township, Pine Mount [= Mount Gibbon]; Springtown Cemetery, Springtown Road, Pine Mount Creek, Davis Mill, Macanippuck Run in Stow Creek Township, Gum Tree Corner Wildlife Management Area, Stathems Neck, Wheaton Island Road, Gouldtown, Fairfield Township)
312. Big Goose and Little Goose Ponds, Atlantic Co., NJ. (Landing Creek)
313. Bennett Bogs Preserve, Property of The Nature Conservancy and New Jersey Conservation Foundation, Cape May Co., NJ. (North Pond, South Pond)
314. Delaware Water Gap National Recreation Area, Pike and Monroe Counties, PA. and Sussex Co., NJ. (Pocono Environmental Education Center.)
315. Unexpected Wildlife Refuge, Gloucester and Atlantic Counties, NJ
316. Hamilton-Trenton-Bordentown Marsh, Mercer Co., NJ. (Delaware River, Trenton boat launch, Lamberton Road, Watson Creek)

2005 Field Trips

Bartonia No. 64, 2009 (pp. 55–65)

317. Delaware Water Gap National Recreation Area, Pike and Monroe Counties,
318. PA. (Pocono Environmental Education Center (PEEC))
319. Mexico, Juanita Co., PA. [No data]
320. Knights Island Preserve, Cecil Co., MD. (Chesapeake Bay, Sassafras River)
321. Westfall Ridge and McAlisterville Ridge, Juniata Co., PA
322. Catskill Park, Ulster Co., NY
323. Savannahs (Savannas) in the Batsto Natural Area, Wharton State Forest, Burlington Co., NJ. (Atsion Ranger Station, Route 206 in Shamong Township, Tuckerton Stage Road [Quaker Bridge Road], Mullica River, Mullica Campsite trail, Narthecium savannah, The Locks, Batsto River, Batsto. Batsto Bog, Long Savannah, Washington Turnpike)
324. Delaware Water Gap National Recreation Area, Pike and Monroe Counties, PA. (Pocono Environmental Education Center [PEEC])
325. Spungs, Cripples, Blue Holes, and Savannahs (Savannas) of the Pine Barrens of Atlantic and Gloucester Counties, NJ. (Newtonville, Route 54, Leghorn Road, Great Ponds, Three Pond Branch, Inskeeps [Inskips] Blue Hole, Great Egg Harbor, Winslow Wildlife Management Area, Berryland, Monroe Township, Gloucester Co. E. Piney Hollow Road, Weymouth Furnace Co. Park, Hamilton Township, Atlantic Co., Elwood Road (CR 623), Route 322, Great Egg Harbor River Makepeace Lake cranberry tract, Cleveland Pond, Laureldale, Hamilton Township, Big Goose Pond in Hamilton Township, southwest of Egg Harbor City)
326. Milmay Area, Atlantic, Cumberland, and Cape May Counties, NJ (Stephen Creek in Weymouth Township, Atlantic Co. Maple Avenue, Mosquito Landing in the Tuckahoe Wildlife Management Area Upper Township, Cape May Co. Route 49, Head-of-River, Hunters Mill (Estell Manor, Atlantic Co.), Hunters Mill Road (First Avenue) South River, Pennsylvania-Reading Seashore Railroad in Buena Vista Township, Atlantic Co. Greco Road [formerly Park Avenue],

Route 40, South Cedar Branch of the Manantico Creek, Vine Road, New Jersey Central Railroad in Vineland, Cumberland Co., Main Avenue or Main Road Station)

327. Quehanna State Forest Wild Area, Clearfield Co., PA

328. FDR Park, Philadelphia, PA

2006 Field Trips

Bartonia No. 64, 2009 (pp 65–76)

329. Pink Hill Serpentine Barrens, Tyler Arboretum, Media, PA. (in Tyler Arboretum: Pink Hill and Dismal Creek)

330. Southern New Jersey, Cape May, Atlantic, Cumberland, and Salem Counties. (Woodbine, Cape May Co., Routes 550 and 557; Pennsylvania Reading Seashore Lines, Woodbine Junction to Tuckahoe; Aetna Furnace in Atlantic Co., Co. Route 666 and Tuckahoe River; Gum Tree Corner Wildlife Management Area, Cumberland Co., Tindall Island; Route 602, Buckhorn Road; Muttontown Woods near Quinton in Salem Co., Salem River, Sharptown Woods)

331. Crosswicks Creek Co. Park, Upper Township, Monmouth Co., NJ. (New Egypt)

332. Birdsboro Reservoir, Berks Co., Pennsylvania [No data]

333. Red Clay Creek, Chester Co., PA

334. Hairgrass Savanna on Blue Mountain (Kittatinny Ridge) near Palmerton, Carbon and Lehigh Counties, PA. (State Game Land 217, Appalachian Trail, Lehigh Gap Wildlife Refuge, Lehigh Gap Nature Center, Lehigh River)

335. Burden Hill Forest, Salem Co., NJ. (Alloway, Quinton, and Lower Alloways Creek, Thundergut Pond Wildlife Management Area, Cohansy Formation west of Telegraph Road (Route 540), Kirkwood Formation, Elkinton Millpond, North Burden Hill Road, Berrys Chapel Road west of Route 49 [NLT Sickler-Waters parcel])

336. Bunker Hill Bogs and John F. Johnson Memorial Park, Jackson Township, Ocean Co., NJ. (Doves Mill Branch of the Toms River, John F. Johnson Memorial Park)

337. Warren Grove Gunnery Range, East (Lower) Plains, Burlington Co., NJ. (between Cabin Road and Oswego River)

338. Bulls Island Recreation Area, Hunterdon Co., NJ (Delaware River)

2007 Field Trips

Bartonia 65, 2011 (pp 126–137)

339. Pinelands National Reserve, NJ (New Jersey Conservation Foundation's Four Mile Spring Preserve, Tuckahoe area, ["Hampton-Central Big Pond"] near Hampton Furnace, Lebanon Fire Tower, Route 542, Merrygold Branch, and Stafford Forge Wildlife Management Area, Atsion, Wading River, Mullica River)

340. John A. Phillips Preserve, Old Bridge, Middlesex Co., NJ

341. Duke Island Park, Bridgewater, Somerset Co., NJ (Raritan River)

342. Crosswicks Creek, Cream Ridge, Monmouth Co., NJ [No data]

343. John A. Phillips Preserve, Old Bridge, Middlesex Co., NJ

- 344. Tucquan Preserve, Erbs Mill, Lancaster Co., PA (Holtwood dam)
- 345. Peaslee Wildlife Management Area, Cumberland Co., NJ. (Cumberland Pond, Port Elizabeth, Halberton, Mays Landing)
- 346. East Plains — Stafford Forge Wildlife Management Area, Ocean Co. & Warren Grove Gunnery Range, Burlington Co., NJ. (Watering Place Pond).
- 347. Intermittent Hampton-Central Ponds and Vicinity, Wharton State Forest, Burlington Co., NJ. (Hampton Gate, Carranza Road, Hampton Furnace, High Crossing Road, South Pond, Southwest Pond, Route 563, Hog Wallow)
- 348. Daleville, Chester Co., PA. (Elk Creek, Brandywine Conservancy property)
- 349. Welsh Mountain, Chester Co., PA. (Struble Lake)
- 350. Sandy Hook, Gateway National Recreation Area, Monmouth Co., NJ. (Plum Island)
- 351. Silver Lake/Delhaas Woods and 5-Mile Woods, Bucks Co., PA. (Five-Mile Woods Preserve, Lower Makefield Township)

2008 Field Trips

Bartonia 65, 2011 (pp 138–147)

- 352. Winslow Township, Camden Co. and Monroe Township, Gloucester Co., NJ. (Piney Hollow Road, Winslow Fish and Wildlife Management Area, Inskip's Blue Hole, Great Egg Harbor River, Blue Anchor Fireline, Winslow Road, Atlantic City Expressway, Morgan Road, Malaga Road, New Brooklyn)
- 353. Smithville, Burlington Co., NJ. [No data]
- 354. Bowman's Hill Wildflower Preserve, Bucks Co., PA
- 355. Ker-Feal (country estate of Albert Barnes), West Pikeland Township, Chester Co., PA
- 356. The Pinelands National Reserve, sections of Ocean and Burlington Counties, NJ. (Le Clare homestead, Little Plains, Warren Grove, Warren Grove Air National Guard Gunnery Range, Wells Mills Co. Park, Cold Brook, Oswego Cranberry/Blueberry Research Center near Jenkins, Oswego River above Martha Furnace, Webbs Mills, Whitesbog, Pakim Pond in Brendan Byrne [Lebanon State] Forest)
- 357. Haycock Mountain, Bucks Co., PA. (State Game Lands 56, Lake Warren, Nockamixon Cliffs, Delaware River)
- 358. Ramapo Mountains, Bergen and Passaic Counties, NJ. (Glasmere Ponds)
- 359. Burden Hill Forest, Salem Co., NJ. (Telegraph Road [Route 540], Alloway, Jericho, Hell Neck Road, Buckhorn Gun Club, Salem Barrens)
- 360. Intermittent Ponds, Westecunk Creek Watershed, Stafford Forge Wildlife Management Area, Ocean Co., NJ. (Warren Grove, Cervetto Road, Three-Foot Branch of Westecunk Creek, Three-Foot Headwaters Pond, Round Pond, Pond 74, Route 539, Governors Branch, Stafford Forge, Stafford Business Park, Manahawkin)
- 361. Bowman's Hill Wildflower Preserve, Bucks Co., PA
- 362. Delaware Bay Shore, Cumberland Co., NJ. (Dividing Creek, Hansey Creek Road, Berrytown Road)

2009 Field Trips

Bartonia, No. 66, 2013 (pp. 82–92)

363. South Campus, West Chester University, Chester Co., PA. [No data]
364. Wallace Township, Chester Co., PA. (Property of Rick and Stacy Reinhart, Homestead Lane in Glenmoore)
365. The Poconos at Dingmans Ferry, PA. (Pocono Environmental Education Center)
366. Haycock Mountain, Bucks Co., PA. (State Game Lands 56, Nockamixon Cliffs, Delaware River)
367. Britton's Savannah, Middle Branch of the Forked River, Lacey Township, Ocean Co., NJ. (Wells Mills Co. Park, Route 532, Waretown, Tuckerton Railroad, Middle Branch of the Forked River)
368. Fulshaw Craeg Preserve, Montgomery Co., PA. (Harleysville)
369. Savannahs of the Batsto River, Wharton State Forest of Burlington Co., NJ. (Atsion Ranger Station along Route 206, Quaker Bridge Road to a branch trail that terminated at the Batsto River, Lower Forge Savannah, Lou Hand's Savannah," Odd Spot)
370. Cumberland Pond, Manumuskin, and Head-of-River, Cumberland and Cape May Counties, NJ (Cumberland Pond along the Manumuskin River, Union Road, Head-of-River, Manumuskin railroad station, Port Cumberland Road)
371. Pocono Glacial Till Barrens, Monroe Co., PA. (Nature preserves owned by Monroe Co. and the Bethlehem Water Authority, Long Pond)
372. Ramapo Mountains, Bergen and Passaic Counties, NJ. (New Jersey Botanical Garden, Defiance Ridge en route to Glasmere Ponds, Pierson Ridge, Spruce Swamp)

2010 Field Trips

Bartonia, No. 66 (2013), pp. 93–105

373. Nottingham Co. Park, Chester Co., PA. [No data]
374. Nottingham Co. Park, Chester Co., PA. [No data]
375. Stow Creek and Quinton, Cumberland and Salem Counties, NJ. (Gum Tree Corner Wildlife Management Area, Stow Creek Township, Canton Road [Co. Rte. 623], Willis Corner, Quinton)
376. Sussex Branch Trail, Sussex Co., NJ. (Andover)
377. Unionville Serpentine Barrens, Chester Co., PA.
378. Edwin B. Forsythe National Wildlife Refuge, Barnegat Division Forked River and vicinity, Ocean Co., NJ. [No data]
379. Atsion Area, Pinelands of Southern New Jersey [No data]
380. Batsto [No data]
381. Chatsworth [No data]
382. Atsion [No data]
383. Lower Forge [No data]
384. Atsion, Mullica River [No data]
385. Maurice River, Millville, Vineland, Cumberland Co., NJ. (Maurice River, Millville's Sharp Street Park, Union Lake dam, City of Millville, Vineland)

- 386. Pitch Pine Lowlands of Atsion-Dutchtown, Wescott Bogs, Wharton State Forest, Burlington and Atlantic Counties, NJ. (Jersey Central line at Atsion, Route 206, Dutchtown luncheonette)
- 387. Sourland Mountain Preserve, Somerset Co., NJ
- 388. Early Winter Botany at Delhaas Woods, Bucks Co., PA.

2011 Field Trips

Bartonia, No. 66, 2013 (pp. 105–119)

- 389. Franklin Parker Preserve, Burlington Co., NJ. [No data]
- 390. Hamilton-Trenton-Bordentown Marsh, Burlington Co., NJ. (Bordentown Township's Northern Community Park, Crosswicks Creek)
- 391. Burden Hill Forest, Alloway and Quinton Townships, Salem Co., NJ. (Cohansey-Pecks Corner Road, Old Stage Coach Road, Woodmere Lake, Thundergut Pond Wildlife Management Area)
- 392. Nottingham Serpentine Barrens, Chester Co., PA.
- 393. New Jersey Pine Barrens, Atsion, Burlington Co. and Pleasant Mills, Atlantic Co., NJ. (Cherry Hill Road = Pyxie Road, Pleasant Mills)
- 394. Columcille and Tannersville Bog, Northampton and Monroe Counties, PA. [No data]
- 395. Atsion Pitch Pine Lowlands, Hampton Furnace vicinity, Chatsworth environs, Dwarf Forest in Burlington and Ocean Counties, NJ
- 396. Hirst Ponds Preserve (Germania Ponds), Germania, Galloway Township, southeast of Egg Harbor City, Atlantic Co., NJ. (Leipzig Avenue Pond, Duerer Avenue Pond, Labounsky Pond, Duerer Street (Route 531), Leipzig and Mannheim Avenues, Clarks Mill Stream)
- 397. Crow's Nest Preserve, Northwestern Chester Co., PA. (French Creek State Park Pottstown)
- 398. Cresheim Creek, Wissahickon Section of Fairmount Park, Philadelphia, PA. (Mt. Airy, St. George's Road, Gate House Lane)
- 399. Houston Meadows, Fairmount Park, Philadelphia, PA

2012 Field Trips

Bartonia 67, 2015 (92–105)

- 400. Bartram's Garden, Philadelphia, PA. [No data]
- 401. Crow's Nest Preserve, Northwestern Chester Co., PA. (French Creek State Park, Pottstown)
- 402. Long Pond, Monroe Co., PA. [No data].
- 403. Sourland Mountain Preserve, Somerset Co., NJ
- 404. Wissahickon Creek, Fairmount Park, PA. [No data]
- 405. Wickecheoke Creek Preserve, Hunterdon Co., NJ. (Stockton, Lower Creek Road. Route 519, Loop Three parking area, Upper Creek Road)
- 406. Crow's Nest Preserve, Chester Co., PA. (Piersol Road, Hopewell Road, The Chief's Circle)
- 407. Slippery Rock University and Presque Isle, PA. (Butler Co., Jennings Environmental Education Center, Prairie Ecosystem Trail; Presque Isle State

- Park on Lake Erie, Slippery Rock Gorge Natural Area, Moraine State Park, McConnells Mill State Park)
408. Whitesbog section of Brendan Byrne State Forest (formerly Lebanon State Forest), Burlington and Ocean Counties, NJ. (Suningive, Lakehurst Road [Route 530], Pole Branch, Route 70, Big Tank reservoir, Gaunt 's Brook, Fort Dix)
 409. North Branch Preserve of the Rancocas Conservancy, New Lisbon vicinity, Pemberton Township, Burlington Co., NJ (Rancocas Creek, Pemberton Bypass, Route 530 Spur, Blueberry and Cranberry Experimental Station, Browns Mills-Pemberton Road)
 410. Brendan T. Byrne State Forest, Burlington Co., NJ. [No data]
 411. Quaker Bridge Vicinity, Wharton State Forest, Burlington Co., NJ. (Batsto River)
 412. Bartram's Garden, Philadelphia, PA. [No data].
 413. Burden Hill Forest, Alloway and Quinton Townships, Salem Co., NJ. (Peck's Corner, Old Stage Coach Road, Spillway Drive, Thundergut Wildlife Management Area, Deep Run pond, Woodmere, Holgate Road)
 414. Hamilton-Trenton-Bordentown Marsh, Mercer Co., NJ (Spring Lake, Hamilton Water Treatment facility)
 415. Warren Grove Gunnery Range, Warren Grove, Burlington and Ocean Counties, NJ
 416. Fulshaw Craeg Preserve, Montgomery Co., PA

2013 Field Trips

Bartonia 67, 2015 (105–122)

417. Blackbird State Forest, New Castle Co., DE. (Tybout Tract, Blackbird Forest Road, Cypress Complex Tract along Saw Mill Road)
418. Shenk's Ferry, Lancaster Co., PA. (Susquehanna River)
419. Crosswicks Creek, Mercer Co., NJ. (Bordentown's Northern Community Park, Groveville Road)
420. Franklin Parker Preserve, Chatsworth, Burlington Co., NJ. [No data]
421. Bartram's Garden, Philadelphia, PA. [No data]
422. Crow's Nest Preserve, Chester Co., PA. (Hopewell Road, Piersol Road)
423. Glen Onoko, Carbon Co., PA. (State Game Lands 141, Lehigh Gorge State Park, Chameleon Falls, Glen Onoko Falls, Broad Mountain)
424. Cedar Swamp, Flood Gates, Repaupo Station, Gloucester Co., NJ. (Flood Gate Road, Repaupo Creek with the Delaware River)
425. Calico Ridge, Cutt's Pump, and Buck Run Savannas above Martha Furnace, Wharton State Forest, Burlington Co., NJ. (Harrisville Lake on Route 679, Oswego River, Cutt's Pump, Buck Run at the Old Martha Road)
426. Dutchtown, Atsion, Old Forge Pond above Pleasant Mills, Wharton State Forest, Burlington and Atlantic Counties, NJ. (Route 206, Miller's Bogs, Mullica River, West Mill Road, old Batsto Nature Trail, Bridge #5, Meschescatauxin Creek, Forge Pond)
427. Hazelton Bog (Valmont Bog Sanctuary), Luzerne Co., PA.
428. Fairmount Park, northwest Philadelphia, PA. (Wissahickon Valley, Cedars House, Forbidden Drive)

- 429. Sadsbury Woods Preserve, Chester Co., PA. [No data]
- 430. Upper Maurice River watershed, Cumberland Co., NJ. (Vineland, Maurice River, Sherman Avenue, Route 55, Deerfield Township)
- 431. Thomas F. Breden Preserve, Milford Bluffs, Hunterdon Co., NJ. [No data]
- 432. Lower Manantico, Manumuskin, and Maurice River watersheds, Cumberland Co., NJ. (Manantico Creek, Millville, Pennsylvania Railroad)
- 433. Delhaas Woods, Bucks Co., PA. (Silver Lake Nature Center along Bath Road in Bristol)
- 434. New Jersey Pine Barrens. [No data]
- 435. Delaware Bayshore, Cumberland Co., NJ. (Bayside, Caviar, Turkey Point in Downe Township, Bivalve, Thompsons Beach, Maurice River Township)
- 436. Bear Swamp, Downe Township, Cumberland Co., NJ. (Payntors Corner)
- 437. Spring Mountain and the Perkiomen Trail, Montgomery Co., PA. (Chancellorsville, Cedar Road, Perkiomen Creek)

2014 Field Trips

Bartonia 68, 2016, pp 91–111

- 438. Bulls Island State Park, Stockton, Hunterdon Co., NJ
- 439. Shenk's Ferry Wildflower Preserve, Lancaster Co., PA
- 440. Haddington Woods, Cobb's Creek Park, Philadelphia, PA
- 441. Sharptown, Quinton, Pine Mount, Cumberland and Salem Counties, NJ
- 442. "Little Cove" and Shippensburg Area, Franklin, Cumberland and Adams Counties, PA
- 443. The Historic National Beagle Club Institute Farm, Aldie, VA. (Chain Bridge Flats, George W. Thompson State Wildlife Management Area, Wildcat Mountain Retracing the Bartrams' Travels in the Catskill Forest Preserve, Greene Co., NY. (Plant List for Diamond Notch; Plant List for North-South Lake, Kaaterskill Falls)
- 444. Kelly's Run and Tucquan Glen, Lancaster Co., PA
- 445. Unionville Serpentine Barrens, Chester Co., PA
- 446. Edison Bog, Sparta Mountain Preserve, Sussex Co., NJ
- 447. Fulshaw Craeg Preserve and Vicinity, Salford Township, Montgomery Co., PA
- 448. "Britton's Savannah," Middle Branch of the Forked River and other nearby Bog Asphodel Sites, Ocean Co., NJ
- 449. Houston Meadows, Fairmount Park, Philadelphia, PA
- 450. Fairmount Island, Center City, Philadelphia, PA. (Schuylkill River)
- 451. Native fern propagation at the Morris Arboretum, Philadelphia, PA
- 452. *Rhynchospora knieskernii* sites in Stafford Forge Wildlife Management Area and vicinity, Little Egg Harbor Township, Ocean Co., NJ
- 453. Intermittent ponds and associated environments, Cumberland Co., NJ
- 454. Spring Mountain and the Perkiomen Trail, Montgomery Co., PA
- 455. Abbott Marshlands (aka Hamilton-Trenton-Bordentown Marsh), Mercer Co., NJ
- 456. Saddler's Woods, Haddon Township, Camden Co., NJ
- 457. Woody plant propagation workshop and Greeland Nursery Tour, Philadelphia, PA. [no plant list]
- 458. Gwynedd Preserve, Ambler, Montgomery Co., PA

NEWS AND NOTES

FIRST RECORD OF *MAGNOLIA MACROPHYLLA* MICHX. AS A CASUAL ALIEN IN PENNSYLVANIA

Magnolia macrophylla Michx. is a broad-leaved deciduous tree found in the eastern United States. A single individual has been located in the Wissahickon section of Fairmount Park in Philadelphia County, Pennsylvania. It was located on the western side of the Wissahickon Creek, south of Bells Mill road and west of Forbidden Drive, close to the former site of the Andorra Nursery (Bureau of Engineering 1942), which closed in 1961 (Swartley 1974). The plant was under 1 meter tall and had multiple stems; it had very large leaves (over 18" in length) that had auricles. It was growing in a northeast-facing upland hardwood forest stand dominated by *Fagus grandifolia*. The understory included *Kalmia latifolia*, *Polystichum acrostichoides*, and *Epifagus virginiana*. This collection is the first record of the species occurring outside of cultivation in Pennsylvania. *M. macrophylla* is not listed in the Atlas of Vascular Flora of Pennsylvania (Rhoads and Klein 1993) or the second edition of Plants of Pennsylvania (Rhoads and Block 2007). Earlier floras of Pennsylvania (Noll 1852, Porter 1903) do not include it, nor do floras of Philadelphia (Barton 1818, Keller and Brown 1905, Wherry 1968). A voucher specimen has been deposited at the PH Herbarium (Academy of Natural Sciences of Drexel University; Holmes and Hewitt s.n., collected 17 July 2015).

The historic range of *Magnolia macrophylla* is patchy, with its range centered on the area from the Allegheny Plateau in Kentucky and Tennessee south to the Coastal Plain in Mississippi and Alabama. Disjunct occurrences are also found in Arkansas, Ohio (Burns 1988), and the Carolinas (Tompkins 2004). The population in Jackson County, Ohio is thought to represent the northern edge of *M. macrophylla*'s historic range (Burns 1988). Recent extra-range establishment of this species has been documented in Maryland (Riefner and Tremper 1980), Nassau County, New York, southeastern Ontario, northeastern Ohio, and northern Illinois (Greller et al. 2011).

Extra-range expansion by other species in the genus *Magnolia* has been documented in southeastern Pennsylvania. *Magnolia tripetala* naturalized in Philadelphia, Bucks, and Montgomery Counties in the 19th and 20th centuries (Rhoads 1994). A single occurrence of *Magnolia grandiflora* was documented in Philadelphia County in 2011 (Holmes and Hewitt 2015). Range expansion and establishment of satellite populations by *Magnolia* species has been linked to dispersal from cultivated populations and climate change (Bellemare and Deeg 2015, Gruhn and White 2011). Like *M. grandiflora* and *M. tripetala*, *M. macrophylla* is probably establishing in the Philadelphia area from cultivated plants. Seeds of *M. macrophylla* are primarily dispersed by vertebrates via ingestion (Stiles 1980), and the fruit of cultivated specimens is removed by several species of birds (pers. obs.) that are capable of dispersing seeds many meters from the parent plant. *M. macrophylla* is currently present at the site of the now-closed Andorra Nursery, where it was sold (Andorra Nurseries 1939, 1941, 1942) and specimens of the species are not uncommon in cultivation in the Chestnut Hill area (pers. obs). These individuals are likely the source of the wild plant.

LITERATURE CITED

- ANDORRA NURSERIES. 1939. Price list F. 39. Andorra Nurseries, Inc., Chestnut Hill, Philadelphia, Pennsylvania. (courtesy Janet Evans, Pennsylvania Horticultural Society, McLean Library).
- ANDORRA NURSERIES. 1941. Retail Price List 1941. Andorra Nurseries, Inc., Chestnut Hill, Philadelphia, Pennsylvania. (courtesy Don Wheeler; the New York Botanical Garden).
- ANDORRA NURSERIES. 1942. Andorra Nurseries Incorporated, Retail Price List 1942. Chestnut Hill, Philadelphia, Pennsylvania. [The "Magnolia Natives" entry appears on p. 28.]. (courtesy Dorothy Anne Stiefel; Ethel Z. Bailey Horticultural Catalog Collection, L.H. Bailey Hortorium, Cornell University).
- BARTON, W. P. C. 1818. *Compendium Florae Philadelphicae*. M. Carey and Son, Philadelphia, Pennsylvania.
- BELLEMARE, J. AND C. DEEG. 2015. Horticultural Escape and Naturalization of *Magnolia tripetala* in Western Massachusetts: Biogeographic Context and Possible Relationship to Recent Climate Change. *Rhodora* 117(971): 371–383.
- BUREAU OF ENGINEERING. 1942. Philadelphia Land Use Map: Land-Use Zoning Project No. 18313. Plans & Registry Division, Bureau of Engineering Surveys & Zoning, Department of Public Works, Federal Works Progress Administration for Pennsylvania.
- BURNS, J. F. 1988. The Ohio distribution of *Magnolia macrophylla* Michx. and *Magnolia tripetala* L. *Ohio Journal of Science* 89(2): 6.
- GRELLER, A. M., A. J. LINDBERG, M. E. LEVINE, AND L. A. LINDBERG. 2011. *Magnolia acuminata*, *M. macrophylla*, and *M. tripetala* in oak-dominated forests on the North Shore of Long Island, New York. *Journal of the Torrey Botanical Society* 138(2): 225–238.
- GRUHN, J. A. AND P. S. WHITE. 2011. *Magnolia grandiflora* (L.) Range Expansion: A Case Study in a North Carolina Piedmont Forest. *Southeastern Naturalist* 10(2): 275–288.
- HOLMES, M. A. AND D. A. HEWITT. 2015. First occurrence of *Magnolia grandiflora* L. as a casual alien in Pennsylvania. *Bartonia* 67: 84–85.
- KELLER, I. A. AND S. BROWN. 1905. *Handbook of the Flora of Philadelphia and Vicinity*. Philadelphia Botanical Club, Philadelphia, PA.
- NOLL, H. R. 1852. *The Botanical Class-Book and Flora of Pennsylvania*. O.N. Worden, Lewisburg, PA.
- PORTER, T. C. 1903. *Flora of Pennsylvania*. Ginn & Company, Boston, Massachusetts.
- RHOADS, A. F. 1994. *Magnolia tripetala* in Pennsylvania. *Bartonia* 58: 75–77.
- RHOADS, A. F. AND T. A. BLOCK. 2007. *The Plants of Pennsylvania: an Illustrated Manual*, 2nd edition. University of Pennsylvania Press, Philadelphia, Pennsylvania.
- RHOADS, A. F. AND W. M. KLEIN. 1993. *The Vascular Flora of Pennsylvania: Annotated Checklist and Atlas*. American Philosophical Society, Philadelphia, Pennsylvania.
- RIEFNER, R. E., JR. AND J. TREMPER. 1980. *Magnolia macrophylla* Michaux naturalized in Maryland. *Phytologia* 46(5): 283–284.
- STILES, E. W. 1980. Patterns of fruit presentation and seed dispersal in bird-disseminated woody plants in the eastern deciduous forest. *The American Naturalist* 116(5): 670–688.
- SWARTLEY, J. C. 1974. History of the Andorra Nursery. *Bulletin of the Morris Arboretum* 25(2): 20–22.
- TOMPKINS, R. 2004. An ecological study of *Magnolia macrophylla* in Gaston County, North Carolina. *Castanea* 69(2): 178–185.
- WHERRY, E. T. 1968. A Check-list of the Flora of Philadelphia County, Pennsylvania. *Bartonia* 38: 1–17.

MARION ANDREWS HOLMES, *Department of Environmental and Plant Biology, Ohio University*
 DAVID A. HEWITT, *Department of Botany, Academy of Natural Sciences*

NEW ALLEGHENY COUNTY, PENNSYLVANIA OCCURRENCES FOR
CRATAEGUS CHRYSOCARPA AND *GERANIUM DISSECTUM* PLUS THE
REDISCOVERY OF *SHERARDIA ARVENSIS*

We report on two new species occurrences within Allegheny County, one native to Pennsylvania and another native to Europe, that represent the extension of ranges within Pennsylvania for both plus an additional species that has not been contributed to herbarium collections within the state in over half of a century. The following taxonomic nomenclature follows Rhoads & Block (2007). Specimens have been deposited in the herbarium of Carnegie Museum of Natural History (CM) in Pittsburgh, Pennsylvania (Mid-Atlantic Herbaria Consortium, 2018).

One species, *Crataegus chrysocarpa*, is native to Pennsylvania and likely reflects an under-recorded species due to the difficulty in identifying species of *Crataegus*. One may distinguish *C. chrysocarpa* by the characteristics of the mature leaves. Unlike other Pennsylvania hawthorn species that also have lobed, toothed leaves that are not cordate at the base, the mature leaves of *C. chrysocarpa* are not hairy beneath (Rhoads & Block, 2007). The leaves are usually appressed-short pubescent above and pubescent mainly on the veins beneath, variably glabrate later in Canada (Phipps & O'Keenan 2004). Identification as *C. chrysocarpa* was confirmed by comparison to *Crataegus* specimens in the collection at the Carnegie Museum of Natural History, including specimens identified by *Crataegus* specialists James Phipps and James Macklin. The presence of *C. chrysocarpa* in counties surrounding Allegheny County in Pennsylvania, the easternmost counties of Ohio, and the fact that *Crataegus* is a daunting genus to identify, suggest that *C. chrysocarpa* has probably been overlooked in Allegheny County. The specimen may warrant molecular analysis, as *Crataegus* species hybridize readily and recent Pennsylvania botanical studies have neglected the genus (Rhoads & Block, 2007).

The second species we report as novel to the county, *Geranium dissectum*, is important due to the invasive tendency of the species (Schlaepfer et al. 2010, Lee et al. 2018) and paucity of reports for the species in western Pennsylvania. This European species can be distinguished by short peduncles, small flowers with subulate tips terminating the sepals, and spreading hairs on the carpels. (Gleason & Cronquist 1991). Prior to this study, the species was known from Philadelphia, Chester, and Schuylkill counties in the southeastern corner of the state (Kartesz 2015, USDA 2017) and in two counties within western Pennsylvania: Butler and Crawford (Chmielewski et al. 2016). In states adjacent to Pennsylvania, the species appears to be sporadically distributed as well: collections are only known from two (non-contiguous) western counties in Ohio, one county within West Virginia, and six (non-contiguous) counties in New York (USDA 2017). Carnegie Museum of Natural History herbarium (CM) also has recent specimens from Cambria and Washington Counties in western Pennsylvania.

The third species we report, *Sherardia arvensis*, has only been collected in Allegheny County three times prior to this collection. The past collections being from 1911, 1919 and the most recent from 1949, while the latest records from regional herbarium collections for the entirety of Pennsylvania are from 1960 (Mid-Atlantic Herbaria Consortium 2018). *S. arvensis* strongly resembles *Galium* spp., the two genera sharing distinctive whorled leaves. Distinguishing *S. arvensis* are the funnellform corolla and flowers in involucrate heads. *Asperula arvensis* L. also has flowers in involucrate heads, but the involucre bracts of *A. arvensis* are rounded at the tip, while the involucre bracts of *S. arvensis* taper to sharp points (Gleason & Cronquist 1991).

VOUCHER SPECIMENS: PENNSYLVANIA. ALLEGHENY CO.: Approximately six individuals of *Crataegus chrysocarpa* found on the Eden Hall Campus of Chatham University, 6035 Ridge Road, Gibsonia, Pennsylvania on 31 May 2017, 40.66255N, 079.96042W, *J. Mannino* 53 (CM). The individuals are all mature, open shrubs on a streambank at the bottom of a forested hillside dominated by a mature canopy of *Quercus* spp., *Acer rubrum* L., *Prunus serotina* Ehrh., and *Fagus grandifolia* Ehrh.. Nearby herbaceous flora during the month in which *C. chrysocarpa* was collected consisted mainly of *Symplocarpus foetidus* (L.) Salisb. ex W.P.C. Barton.

VOUCHER SPECIMENS: PENNSYLVANIA. ALLEGHENY CO.: One *Geranium dissectum* found on the Eden Hall Campus of Chatham University, 6035 Ridge Road, Gibsonia, Pennsylvania on 7 July, 2017, 40.66369N, 079.95547W, *J. Mannino* 92 (CM). A single spreading, ascending individual was found growing in a sun-exposed flower garden mulched with wood and bark chips, although not intentionally planted. Associated with *Liatris spicata* (L.) Willd. Ground crews removed plants during routine weeding, but *G. dissectum* was again found in the same location in September 2017.

VOUCHER SPECIMENS: PENNSYLVANIA. ALLEGHENY CO.: A single individual of *Sherardia arvensis* was found on the Eden Hall Campus of Chatham University, 6035 Ridge Road, Gibsonia, Pennsylvania, 40.66720N, 079.95621W, on 31 May, 2017, *J. Mannino* 50 (CM). Low, clump-forming herb, growing along the driveway at the edge of the oak forest where lawn meets the forest. Only one individual of *S. arvensis* was found at the location and the species was found nowhere else on the campus.

ACKNOWLEDGMENTS

We would like to thank Arthur Link, III and Cierra Snyder for assistance in the field and the Falk Foundation for providing R.M. Utz and J.M. Mannino with funding to conduct botanical research on the grounds of Eden Hall.

LITERATURE CITED

- CHMIELEWSKI, J. G., KRAYESKY, D. M. AND S. D. LOTZ. 2016. New Pennsylvania county occurrences for *Cardamine impatiens*, *Geranium dissectum*, *Lamium galeobdolon*, *Lathyrus latifolius*, and *Rosa gallica*. *Bartonia* 68: 86–88.
- GLEASON, H. A. AND A. CRONQUIST. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada, Second Edition*. New York Botanical Garden, Bronx, New York.
- KARTESZ, J. T. The Biota of North America Program (BONAP). 2015. North American Plant Atlas. Chapel Hill, North Carolina. Accessed online at <http://bonap.net/napa>
- LEE, J.-W., KIM, S.-J., AN, J.-B., NAM, K.-B., SHIN, H.-T., AND S.-Y. JUNG. 2018. Distribution characteristics of invasive alien plants in Jejudo. *Journal of Asia-Pacific Biodiversity* 11: 276–283.
- MID-ATLANTIC HERBARIA CONSORTIUM. 2018. Pennsylvania flora. Accessed online at <http://midatlanticherbaria.org/portal/checklists/dynamicmap.php?interface=checklist>
- PHIPPS, J. B. AND R. J. O'KEENAN. 2004. A review of *Crataegus* series *Rotundifoliae* (Rosaceae) in western Canada. *Sida, Contributions to Botany* 21: 67–77.
- RHOADS, A. F. AND T. A. BLOCK. 2007. *The Plants of Pennsylvania, an Illustrated Manual, 2nd edition*. University of Pennsylvania Press, Philadelphia, Pennsylvania.
- SCHLAEPFER, D. R., GLÄTTLI, M., FISCHER, M., AND M. VAN KLEUNEN. 2010. A multi-species experiment in their native range indicates pre-adaptation of invasive alien plant species. *New Phytologist* 185: 1087–1099.

- THIERS, B. 2018. Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. <http://sweetgum.nybg.org/science/ih/>
- UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE. 2017. The PLANTS Database. National Plant Data Team, Greensboro, NC 27401-4901 USA. Accessed online at <http://plants.usda.gov>

JOSEPH C. MANNINO AND RYAN M. UTZ, *Falk School of Sustainability,
Chatham University*

BONNIE L. ISAAC, *Carnegie Museum of Natural History*

BAYARD LONG AWARD FOR BOTANICAL RESEARCH

The research project must advance our knowledge of plants that occur in the northeastern and mid-Atlantic region of the United States, especially the Philadelphia area. Specifically, the research project must include at least one plant species found in this region, although it can include additional plants not found in the region. (For example, a systematic botany project focusing on a genus with worldwide distribution but with one or more species occurring in the northeastern U.S. would be eligible.) For purposes of this award plants are as traditionally defined to include green plants as well as the plant-like organisms: lichens, fungi, and all groups of algae. We especially encourage applications on projects that focus on field work and/or herbarium work.

The award will generally be for approximately \$1000. Higher amounts will be considered depending on needs. The application deadline is December 15. Details on applying are available on the club's web site (www.philbotclub.org/long_award.html).

We are pleased to announce the following Bayard Long Awards.

2018 Bayard Long Award

Toby Liss (SUNY-ESF) for her project, "Maximizing green roof functionality through appropriate species selection."

Stormwater runoff from impervious surfaces is a major environmental challenge, and green roofs are one way to help manage this problem. However, the species commonly grown on green roofs do not maximize the removal of stormwater, because they do not maximize evapotranspiration. Conditions in many high-stress, low-resource habitats such as savannas and barrens mirror those on green roofs. Selecting plants from stressed habitat types such as the serpentine barrens of eastern Pennsylvania and northern Maryland could yield many appropriate species that have never been planted on green roofs. Research indicates that there may be a number of species that exhibit high water use and yet are still drought tolerant. Toby has done preliminary experiments to identify additional species that will grow well on green roofs, and is developing experiments that will test whether the diversity of species grown on a green roof influences the overall evapotranspiration rate. She hopes to use her results to help designers make informed plant selections when they build green roofs.

2017 Bayard Long Award

Tesa Madsen-McQueen, (Appalachian State University) for her project, “Phylogeography of *Kalmia buxifolia*; unravelling a geographic and ecological disjunction.” Tesa has provided a description of her research.

“Understanding the role that geography, history and ecology play in promoting genetic diversity within a species remains an elusive question in evolutionary biology. *Kalmia buxifolia* is an evergreen shrub endemic to the southeastern United States that exhibits a geographic disjunction, as well as occupying divergent habitats. Populations occur in the New Jersey Pine Barrens, in the Southern Appalachian Mountains, as well as the Sandhills and Cape Fear Arch region of the Carolinas. Much debate and speculation has surrounded the status of the species, whether it is in fact one species, and taxonomists over the last 150 years have divided the plant into up to three recognized varieties for each physiographic region. A previous study of the species utilizing allozyme frequencies showed a general genetic and morphological clustering of mountains and coastal populations, despite further geographical distance among coastal populations (Wyatt 1991). These results imply that mechanisms other than geographical distance have had a strong effect on current genetic structure. Populations experiencing long-term separation, as with disjunct distributions, provide an insightful opportunity to test the effects of genetic and environmental processes in shaping current genetic variability. Utilizing molecular genetic markers, species distribution modeling, and ecological field sampling, I am investigating the taxonomic status, genetic relationships across the landscape, and possible correlations to environmental variables influencing the curious distribution of this interesting plant.”

2016 Bayard Long Award

Max Piana (Rutgers University) for his project, “Seed dispersal and recruitment limitation in urban forest fragments.”

PHILADELPHIA BOTANICAL CLUB GRANTS FOR BOTANICAL RESEARCH, EDUCATION, AND CONSERVATION

The Philadelphia Botanical Club Grant for Botanical Research, Education, and Conservation provides support for Philadelphia Botanical Club members who are conducting research, developing educational programs, or working on conservation efforts that involve plants. The grant, which started in 2014, typically supports two projects each year. The grant is open to all club members; for application information, see www.philbotclub.org/pbc_grant.html or write to the club.

The PBC grant committee is pleased to announce these awards for 2014–2017

2017 Grants

Joni Baumgarten (Rutgers University) was awarded a grant for her project, “How edaphic conditions influence the population success of rare sedge *Rhynchospora knieskernii*.”

Joni Baumgarten is a graduate student in the ecology and evolution program at Rutgers University. The aim of her research is a better understanding of the conditions that promote the growth of *Rhynchospora knieskernii*, a federally threatened sedge that grows in the

New Jersey Pine Barrens. Ms. Baumgarten will investigate how mycorrhizal colonization of *R. knieskernii* relates to the soil nutrients and to the mycorrhizal community of other graminoid species that grow nearby. She will also take advantage of existing water-table-monitoring wells to study how hydrology affects *R. knieskernii* seed germination.

Maddison Paule (Jenkins Arboretum) was awarded a grant for her project, "Hillside restoration at Jenkins Arboretum & Gardens."

Maddison Paule is Head Horticulturist at Jenkins Arboretum, which is working to restore a degraded part of its property to ecological health. On a two-acre tract, Jenkins seeks to create a wildlife corridor by planting native plants that provide high-value food sources for birds, bees, and butterflies. The grant will enable Jenkins to purchase native shrubs and perennials for this restoration. Jenkins plans to use the area for guided tours and educational programs to teach about the benefits of wildlife, the plants that attract it, and the value of biodiversity.

2016 Grants

Jennifer Blake-Mahmud (Rutgers University) was awarded a grant for her project, "Temporal and environmental dimensions of variable sex expression in striped maple."

A plant's sex is usually a fixed characteristic, but in rare cases sex expression is flexible and may be influenced by size or environmental factors. Striped maple (*Acer pensylvanicum*) is a subdioecious tree; the majority of individuals are either male or female in any given year, but a small proportion (<5%) express both male and female genders. Individual trees may switch expression from year to year, sometimes repeatedly. The conventional theory predicts that, due to the energy costs of setting seed, larger individuals will be female; however, previous work and Ms. Blake-Mahmud's studies so far suggest that gender in striped maple has little relationship with size. Instead, gender changes may be induced by environmental signals and by carbohydrate availability. Ms. Blake-Mahmud, a graduate student in Rutgers' Ecology and Evolution program, proposes to test these ideas in a study of five striped maple populations in northern New Jersey. She has been monitoring these populations for the past three years, and has experimentally manipulated carbohydrate translocation in the trees. Funding from the PBC grant will support the two additional years of monitoring needed to extend her gender observations and to see the results of the manipulations.

Jordan Hoffman (Institute of Systematic Botany, The New York Botanical Garden) was awarded a grant for his project, "Combing for beach broccoli: first assessment of the endemic lichen *Cladonia submitis* in the New Jersey Pinelands and Delmarva using citizen science."

Lichens are understudied in terms of their imperilment and need for conservation. *Cladonia submitis* (known as beach broccoli) is one of many lichens thought to be at risk or in decline. This large, easily recognizable lichen is endemic to dunes and sandy inland habitats in the Mid-Atlantic. In 2015, the species was nominated for IUCN assessment based on speculation that it faced diverse threats including land use change and sea-level rise. Jordan Hoffman proposes to advance conservation assessment of beach broccoli as part of his graduate work at City University of New York. He plans to revisit the historical *C. submitis* sites in the Philadelphia Botanical Club local area to update our knowledge of its distribution and estimate extant population size. To survey sites more efficiently and engage the community in conservation, he will partner with local volunteer organizations,

including the Boy and Girl Scouts of America, for a subset of the surveys. With the data they collect, the conservation assessment will be revised to provide a more detailed analysis of the status of *C. submitis*. Moreover, researchers and managers will be able to use the assessment to generate more effective conservation strategies for the species.

2015

Christopher Hoess (Delaware Technical Community College) was awarded a grant for his project, "Analysis of soils supporting growth of *Adiantum pedatum* on and off serpentine."

2014

Allison Ostertag, (Grumblethorpe Historic House and Garden) was awarded a grant for her project, "Education materials for Grumblethorpe House on the history of plant collecting and plant species of note in the garden."

Ann Rhoads (Emerita at Morris Arboretum of the University of Pennsylvania) and Roger Latham (Continental Conservation) were awarded a grant for their project, "Adaptive management restoration of the Unionville Serpentine Barrens."

2015–2016 FIELD TRIPS

2015

22 April (Wednesday): Wigard Woods, Wissahickon Park, Philadelphia County, Pennsylvania.

This was a joint trip with Philadelphia Parks and Recreation, to a site that where they are clearing and constructing a deer exclosure. We saw, listed in approximately chronological order as we walked in from Wigard Avenue, the following plants ("flr" = in flower): multiflora rose (*Rosa multiflora*) – abundant, evidence of deer browse, lesser celandine (*Ranunculus ficaria*) [flr], flowering crab (*Malus* sp.) [flr], stinging nettle (*Urtica dioica*), wild garlic (*Allium vineale*), common blue violet (*Viola sororia*), jewelweed (*Impatiens* sp.) – seedlings, goldenrod (*Solidago* sp.) – seedlings, agrimony (*Agrimonia* sp.) – seedlings, Japanese honeysuckle (*Lonicera japonica*) – not vining – abundant, jumpseed (*Polygonum virginianum*), garlic mustard (*Alliaria petiolata*) – abundant, some in flower, English ivy (*Hedera helix*), bush honeysuckle (*Lonicera maackii*), Japanese barberry (*Berberis thunbergii*), poison ivy (*Toxicodendron radicans*), narrowleaf bitter cress (*Cardamine impatiens*), pokeweed (*Phytolacca americana*), Indian strawberry (*Duchesnea indica*), cork tree (*Phellodendron amurense*), wineberry (*Rubus phoenicolasius*), spicebush (*Lindera benzoin*), linden viburnum (*Viburnum dilatatum*) – evidence of deer browse, Asian bittersweet (*Celastrus orbiculatus*), sedge (*Carex* sp.), Japanese angelica tree (*Aralia elata*), privet (*Ligustrum* sp.), common chickweed (*Stellaria media*), catbrier (*Smilax* sp.), Virginia creeper (*Parthenocissus quinquefolia*).

Under the densely vegetated area that is to be cleared (it is dense with *R. phoenicolasius*, *R. multiflora*, *B. thunbergii*), there was also: Indian strawberry, violets (*Viola* sp.), and black cherry (*Prunus serotina*) seedlings. This trip was curtailed due to weather.

Attendance: 9. Report by leader: David Hewitt.

25 April (Saturday) 2015: West Fairmount Park, Philadelphia County, Pennsylvania.

We saw, listed in approximately chronological order as we walked from the Belmont Avenue side of Concourse Lake, the following plants (includes cultivated plants):

Around Concourse Lake

Dwarf fothergilla (*Fothergilla gardenii*), pussy willow (*Salix discolor*), dandelion (*Taraxacum officinale*), fragrant sumac (*Rhus aromatica*), water lily (*Nymphaea odorata*), purple loosestrife (*Lythrum salicaria*), redbud (*Cercis canadensis*), pin oak (*Quercus palustris*), common blue violet (*Viola sororia*), black cherry (*Prunus serotina*), smartweed (*Polygonum* spp.), switchgrass (*Panicum virgatum*), oakleaf hydrangea (*Hydrangea quercifolia*), common groundsel (*Senecio vulgaris*), shrubby St. John's wort (*Hypericum prolificum*), river birch (*Betula nigra*), lesser celandine (*Ranunculus ficaria*), Indian atrawberry (*Duchesnia indica*), serviceberry (*Amelanchier canadensis*), London plane (*Platanus × acerifolia*), flowering crabapple (*Malus* sp.), bald cypress (*Taxodium distichum*),

pagoda dogwood (*Cornus alternifolia*), iris (*Iris* sp.), elderberry (*Sambucus canadensis*), red maple (*Acer rubrum*), ninebark (*Physocarpus opulifolius*), multiflora rose (*Rosa multiflora*), pokeweed (*Phytolacca americana*), cattail (*Typha* sp.), sweetbay magnolia (*Magnolia virginiana*), bursting-heart (*Euonymus americanus*), wineberry (*Rubus phoenicolasius*), burdock (*Arctium lappa*), Japanese knotweed (*Fallopia japonica*), garlic mustard (*Alliaria petiolata*), white avens (*Geum canadense*), silver maple (*Acer saccharinum*), sassafras (*Sassafras albidum*)

Centennial Lake Side

Sweetgum (*Liquidambar styraciflua*); ornamental cherries (*Prunus* spp.); star magnolia (*Magnolia stellata*); Japanese honeysuckle (*Lonicera japonica*); water lettuce (*Pistia stratiotes*), buckeye (*Aesculus* sp.)

Around Michaux Grove

Bur oak (*Quercus macrocarpa*); evening primrose (*Oenothera biennis*); mugwort (*Artemisia vulgaris*); skunk cabbage (*Symplocarpus foetidus*); water oak (*Quercus nigra*); Callery pear (*Pyrus calleryana*); devil's walking stick (*Aralia elata*)

Additional observations: Carpenter Bees (*Xylocopa* sp.); Song Sparrows (*Melospiza melodia*); Rough-winged Swallow (*Stelgidopteryx serripennis*); Canada Goose (*Branta canadensis*); Redwing Blackbird (*Agelaius phoeniceus*); Red-tailed Hawk (*Buteo jamaicensis*); American Robin (*Turdus migratorius*)

Attendance: 20. Report by leaders: Mandy Katz and David Hewitt.

03 May (Sunday): Goat Hill Serpentine Barrens, Chester County, Pennsylvania.

This trip began at the parking lot off Red Hill Road and proceeded southwest along the powerline right-of-way. Much of the right-of-way is sparsely vegetated with exposed serpentine rock at the surface, providing habitat for *Arabidopsis lyrata*, *Cerastium velutinum*, *Minuartia michauxii*, *Polygonum tenue* and other typical barrens plants. Crossing a stream on the right-of-way, the access road ascends with a sidehill cut on a moist serpentine hillside, where we saw *Sanguisorba canadensis*, *Zizia aurea*, many *Thalictrum thalictroides* and a few *Heuchera americana*, unusual for a serpentine habitat. We saw a few *Baptisia tinctoria* and some *Phlox subulata* growing on the gravelly terrace above an old magnesite mine, and *Adiantum pedatum* and *Pellaea atropurpurea* growing in crevices in the side of a collapsed mine adit. We then descended through some grassland openings, where we saw the remains of some C4 grasses such as *Sorghastrum nutans* and *Sporobolus heterolepis*. The trail turned northeast and crossed a valley filled with *Pinus rigida*-*Quercus*-*Acer rubrum* mixed forest, with a dense understory of *Smilax rotundifolia*. Janet Novak spotted twelve small *Ophioglossum vulgatum* growing in the pine duff and leaf litter trailside, an unusual find. We saw a few mesic woodland ferns (*Phegopteris hexagonoptera*, *Athyrium filix-femina*) while following Pine Run back to the parking lot.

Species (supplied by Janet Novak): *Acer rubrum*, *Achillea millefolium*, *Adiantum pedatum*, *Alliaria petiolata*, *Alnus* sp., *Amelanchier* sp., *Andropogon virginicus*, *Anthoxanthum odoratum*, *Arabidopsis lyrata*, *Artemisia vulgaris*, *Asplenium platyneuron*, *Athyrium filix-femina*, *Baptisia tinctoria*, *Barbarea vulgaris*, *Berberis thunbergii*, *Betula lenta*, *Boehmeria*

cylindrica, *Botrychium virginianum*, *Capsella bursa-pastoris*, *Ceanothus americanus*, *Cerastium velutinum* ssp. *velutinum*, *Cirsium arvense*, *Daucus carota*, *Dennstaedtia punctilobula*, *Dichanthelium clandestinum*, *Elaeagnus umbellata*, *Eupatorium perfoliatum*, *Eutrochium* sp., *Gaylussacia baccata*, *Geranium maculatum*, *Helianthemum* sp., *Heuchera americana*, *Houstonia caerulea*, *Juniperus virginiana*, *Lamium purpureum*, *Lindera benzoin*, *Lobelia spicata*, *Lonicera* sp., *Luzula multiflora*?, *Maianthemum racemosum*, *Melilotus* sp., *Micranthes virginiensis*, *Microstegium vimineum*, *Minuartia michauxii*, *Mitchella repens*, *Oenothera* sp., *Ophioglossum vulgatum*, *Packera anonyma*, *Parthelypteris noveboracensis*, *Parthenocissus quinquefolia*, *Pellaea atropurpurea*, *Phegopteris hexagonoptera*, *Phlox subulata*, *Pinus rigida*, *Podophyllum peltatum*, *Polygonum tenue*, *Polystichum acrostichoides*, *Potentilla canadensis*, *Prunus avium*?, *Prunus serotina*, *Pteridium aquilinum*, *Pycnanthemum* sp., *Quercus marilandica*, *Quercus prinoides*, *Quercus stellata*, *Rhododendron periclymenoides*?, *Rhus copallinum*, *Rhus typhina*, *Rosa multiflora*, *Rubus phoenicolasius*, *Rubus* sp., *Sabatia angularis*, *Sambucus canadensis*, *Sanguinaria canadensis*, *Sanguisorba canadensis*, *Sassafras albidum*, *Schizachyrium scoparium*, *Setaria* sp., *Smilax glauca*, *Smilax rotundifolia*, *Solidago nemoralis*, *Sorghastrum nutans*, *Spiraea alba*, *Sporobolus heterolepis*, *Symphotrichum depauperatum*, *Taraxacum officinale*, *Thalictrum pubescens*, *Thalictrum thalictroides*, *Tipularia discolor*, *Toxicodendron radicans*, *Tridens flavus*, *Trifolium repens*, *Vaccinium corymbosum*, *Vaccinium pallidum*?, *Verbascum blattaria*, *Verbascum thapsus*, *Viola blanda*?, *Viola sagittata*, *Viola sororia*, *Zizia aurea*

Attendance: Not Listed. Report by leader: Chris Hoess.

13 May (Wednesday): Three Springs Hollow, Pennypack Park, Philadelphia County, Pennsylvania.

This was a joint trip with Philadelphia Parks and Recreation, to a site where they are clearing and constructing a deer enclosure. We saw, listed in approximately chronological order as we walked in from the parking lot on Verree Road, the following plants (“flr” = in flower; “ft” = in fruit):

Parking lot

Persimmon (*Diospyros virginiana*), bush honeysuckle (*Lonicera maackii*) [flr], redbud (*Cercis canadensis*), box elder (*Acer negundo*), American elm (*Ulmus americana*), Robert geranium (*Geranium robertianum*)

On trail to fenced site

Narrowleaf bittercress (*Cardamine impatiens*) [with clasping leaf base], slippery elm (*Ulmus rubra*), spicebush (*Lindera benzoin*), poison ivy (*Toxicodendron radicans*), Japanese honeysuckle (*Lonicera japonica*), jumpseed (*Polygonum virginianum*), lesser celandine (*Ranunculus ficaria*), multiflora rose (*Rosa multiflora*), Asian bittersweet (*Celastrus orbiculatus*), Virginia waterleaf (*Hydrophyllum virginianum*) [flr], box elder (*Acer negundo*), wineberry (*Rubus phoenicolasius*), porcelain berry (*Ampelopsis brevipedunculata*), anise root (*Osmorhiza longistylis*) [flr], wild ginger (*Asarum canadense*), tick trefoil (*Desmodium* sp.), thin-leaf coneflower (*Rudbeckia triloba*), garlic mustard (*Alliaria petiolata*) [flr], stinging nettle (*Urtica dioica*), hackberry (*Celtis* sp.); grape (*Vitis* sp.), Virginia creeper

(*Parthenocissus quinquefolia*), dames rocket (*Hesperis matronalis*) [flr], redbud (*Cercis canadensis*), wild garlic (*Allium vineale*), London plane (*Platanus* × *acerifolia*), American sycamore (*Platanus occidentalis*), greater celandine (*Chelidonium majus*) [flr], orchard grass (*Dactylis glomerata*) [flr], white snakeroot (*Ageratina altissima*), Philadelphia fleabane (*Erigeron philadelphicus*) [flr], false nettle (*Boehmeria cylindrica*), gill-over-the-ground (*Glechoma hederacea*) [flr], pokeweed (*Phytolacca americana*), American beech (*Fagus grandifolia*), Japanese knotweed (*Fallopia japonica* = *Polygonum japonicum*), cutleaf coneflower (*Rudbeckia laciniata*), cinquefoil (*Potentilla fruticosa*) [flr], jewelweed (*Impatiens* sp.), tulip poplar (*Liriodendron tulipifera*) [flr], nodding star of Bethlehem (*Ornithogalum nutans*) [flr] (large flowers), red maple (*Acer rubrum*), red oak (*Quercus rubra*), common blue violet (*Viola sororia*) [flr], blackberry (*Rubus pensilvanicus*) – no hairs, wood aster (*Symphotrichum divaricatum*), mugwort (*Artemisia vulgaris*), deertongue (*Dichanthelium clandestinum*), false Solomon's seal (*Maianthemum racemosum*), dryad's saddle (*Polyporus squamosus*), American strawberry bush (*Euonymus americana*)

Within site to be fenced – wet area/seep/stream

Skunk cabbage (*Symplocarpus foetidus*) – dominant where present, Jack-in-the-pulpit (*Arisaema triphyllum*) [flr], spicebush (*Lindera benzoin*), trout lily (*Erythronium americanum*), New York fern (*Thelypteris noveboracensis*) – dominant in patches, American beech (*Fagus grandifolia*), Virginia creeper (*Parthenocissus quinquefolia*), *Carex* cf. *crinita* [flr], LeConte's violet (*Viola affinis*) [flr], jewelweed (*Impatiens* sp.) – seedlings, blackgum (*Nyssa sylvatica*), catbrier (*Smilax rotundifolia*), dwarf ginseng (*Panax trifolius*) [seeds collected by Max Blaustein, 25 May 2015], poison ivy (*Toxicodendron radicans*), garlic mustard (*Alliaria petiolata*) [flr], winterberry holly (*Ilex verticillata*), red maple (*Acer rubrum*), lizard's tail (*Saururus cernuus*) – multiple well-populated patches, American hornbeam (*Carpinus caroliniana*), stinging nettle (*Urtica dioica*), false Solomon's seal (*Maianthemum racemosum*), tulip poplar (*Liriodendron tulipifera*), tall white lettuce (*Prenanthes altissima*), Japanese stilt grass (*Microstegium vimineum*) – understory to skunk cabbage, narrowleaf bittercress (*Cardamine impatiens*), lesser celandine (*Ranunculus ficaria*) [flr], wood sedge (*Carex* sp.), nodding star of Bethlehem (*Ornithogalum nutans*) [flr – long petals], curly dock (*Rumex crispus*), red oak (*Quercus rubra*), wineberry (*Rubus phoenicolasius*), pignut hickory (*Carya glabra*), shagbark hickory (*Carya ovata*), lady fern (*Athyrium filix-femina*) [red stipe], silvery spleenwort (*Deparia acrostichoides*), broad beech fern (*Phegopteris hexagonoptera*), trout lily (*Erythronium americanum*), cutleaf toothwort (*Dentaria laciniata*), spring beauty (*Claytonia virginica*), [also – Indian poke (*Veratrum viride*) – seen by Max Blaustein, 25 May 2015]

Uphill from wet area

Trout lily (*Erythronium americanum*), Asian bittersweet (*Celastrus orbiculatus*), American holly (*Ilex opaca*) [seedlings], blackhaw (*Viburnum prunifolium*), mile-a-minute (*Polygonum perfoliatum*), white oak (*Quercus alba*), catbrier (*Smilax rotundifolia*), sassafras (*Sassafras albidum*), sweet cherry (*Prunus avium*), ash (*Fraxinus* sp.), shagbark hickory (*Carya ovata*), black oak (*Quercus velutina*) – one with over 4' dbh, tulip poplar (*Liriodendron tulipifera*) [flr], pignut hickory (*Carya glabra*), American beech (*Fagus grandifolia*), black gum (*Nyssa*

sylvatica) – one with over 2' dbh, princess tree (*Paulownia tomentosa*), grape (*Vitis* sp.), bloodroot (*Sanguinaria canadensis*), lesser celandine (*Ranunculus ficaria*), Japanese barberry (*Berberis thunbergii*) – 1 spine per leaf, mayapple (*Podophyllum peltatum*) [no flowers], tree of heaven (*Ailanthus altissima*), mockernut hickory (*Carya tomentosa*), basswood (*Tilia Americana*), tulip poplar (*Liriodendron tulipifera*) [seedlings], black walnut (*Juglans nigra*), nimblewill (*Muhlenbergia schreberi*) – no silvery midrib, looks like stilt grass; Amur corktree (*Phellodendron amurense*), pokeweed (*Phytolacca americana*)

Stream (with bridge) and adjacent wetland

Wintercress (*Barbarea vulgaris*) [flr], water starwort (*Callitriche* sp. likely *stagnalis*, due to habitat – emergent aquatic, small lvs), spring cress (*Cardamine bulbosa*), crested wood fern (*Dryopteris cristata*), skunk cabbage (*Symplocarpus foetidus*), wineberry (*Rubus phoenicolasius*), mile-a-minute (*Polygonum perfoliatum*), stilt grass (*Microstegium vimineum*), Jack-in-the-pulpit (*Arisaema triphyllum*) [flr], jumpseed (*Polygonum virginianum*), pokeweed (*Phytolacca americana*), wild garlic (*Allium vineale*), Solomon's seal (*Polygonatum* sp.) [with buds], southern arrowwood (*Viburnum dentatum*), yellow violet (*Viola pubescens*), tulip poplar (*Liriodendron tulipifera*) [flr]

Bike area (with dirtbike mounds and pits)

Gray birch (*Betula populifolia*), black cherry (*Prunus serotina*), flowering dogwood (*Cornus florida*), virginia creeper (*Parthenocissus quinquefolia*), bloodroot (*Sanguinaria canadensis*), common blue violet (*Viola sororia*) [flr], common milkweed (*Asclepia syriaca*), Amur honeysuckle (*Lonicera maackii*) [flr], catbrier (*Smilax rotundifolia*), deertongue (*Panicum clandestinum*), spicebush (*Lindera benzoin*), Grass-leaved goldenrod (*Euthamia graminifolia*), Sassafras (*Sassafras albidum*), poison ivy (*Toxicodendron radicans*), LeConte's violet (*Viola affinis*), Japanese stiltgrass (*Microstegium vimineum*), common blue violet (*Viola sororia*) [flr], Asian bittersweet (*Celastrus orbiculatus*), Blackberry (*Rubus* sp.), dewberry (*Rubus flagellaris*) [flr] – large flowers about 1" and no hairs visible; ergo: *flagellaris*), garlic mustard (*Alliaria petiolata*) [flr], red oak (*Quercus rubra*), rattlesnake fern (*Botrychium virginianum*) [fertile], Pennsylvania blackberry (*Rubus pensilvanicus*; no visible hairs ergo: *pensilvanicus*), dogbane (*Apocynum cannabinum*), Japanese honeysuckle (*Lonicera japonica*), false Solomon's seal (*Maianthemum racemosum*), pokeweed (*Phytolacca americana*)

Attendance: 11. Report by leader: David Hewitt.

16 May (Saturday): Abbot Marshes, Mercer County, New Jersey.

No report recieved.

21 May (Thursday): Wigard Woods, Wissahickon Park, Philadelphia County, Pennsylvania.

This was a joint trip with Philadelphia Parks and Recreation, to a site where they are clearing and constructing a deer exclosure. We saw, listed in approximately chronological order as we walked in from Wigard Avenue, the following plants ("flr" = in flower; "ft" = in fruit):

Open area near Henry Avenue

Common prickly ash (*Zanthoxylum americanum*), multiflora rose (*Rosa multiflora*) [flr], poison ivy (*Toxicodendron radicans*), pokeweed (*Phytolacca americana*), goldenrod (*Solidago* sp. – most likely *S. gigantea*, glaucous stem, 3-nerved leaves), Asiatic dayflower (*Commelina communis*), Japanese angelica tree (*Aralia elata*), star of Bethlehem (*Ornithogalum umbellatum*) – end of flowering time; bindweed (*Calystegia* sp.), stinging nettle (*Urtica dioica*) [flr], dogbane (*Apocynum cannabinum*), common milkweed (*Asclepias syriaca*), purple loosestrife (*Lythrum salicaria*) – seedling, in dry area; narrowleaf bitter cress (*Cardamine impatiens*) [flr], grape (*Vitis* sp.), wisteria (*Wisteria frutescens*), sweet autumn virginsbower (*Clematis terniflora*), day lily (*Emerocallis* sp. – most likely *fulva*), black raspberry (*Rubus occidentalis*), avens (*Geum* sp. – most likely *canadense*), annual bluegrass (*Poa annua*), burdock (*Arctium lappa*), curly dock (*Rumex crispus*), broadleaf enchanter's nightshade (*Circaea lutetiana*), flat-top goldenrod (*Euthamia graminifolia*), Virginia creeper (*Parthenocissus quinquefolia*), cleavers (*Galium aparine*), spinulose woodfern (*Dryopteris carthusiana*), Canada thistle (*Cirsium arvense*), gill-over-the-ground (*Glechoma hederacea*), common blackberry (*Rubus allegheniensis*) – with numerous gland tipped hairs; figwort (*Scrophularia* sp. – most likely *lanceolata* – leaves were not cordate), field garlic (*Allium vineale*), orchard grass (*Dactylis glomerata*), path rush (*Juncus tenuis*), dandelion (*Taraxacum officinale*), white clover (*Trifolium repens*), black seed plantain (*Plantago rugelii*) – red leaf bases; cinquefoil (*Potentilla simplex*), lesser celandine (*Ranunculus ficaria*), Kentucky blue grass (*Poa pratensis*), common blue violet (*Viola sororia*) – no flowers; mugwort (*Artemisia vulgaris*), sassafras (*Sassafras albidum*), ash (*Fraxinus* sp.) – seedling, white snakeroot (*Ageratina altissima*) – with leaf miners mining; Asian bittersweet (*Celastrus orbiculatus*), Carolina horsenettle (*Solanum carolinense*), winter cress (*Barbarea vulgaris*), deer tongue (*Dichanthelium clandestinum*), agrimony (*Agrimonia* sp.)

At edge into woods

Japanese barberry (*Berberis thunbergii*), Amur honeysuckle (*Lonicera maackii*), burning bush (*Euonymus alata*), dewberry (*Rubus flagellaris*) – not hispid; flowering crabapple (*Malus* sp.), Jack in the pulpit (*Arisaema triphyllum*), Norway maple (*Acer platanoides*), cork tree (*Phellodendron amurense*), English ivy (*Hedera helix*)

In wooded area

Red maple (*Acer rubrum*) – dominant in area nearer to Henry Ave., tulip poplar (*Liriodendron tulipifera*) [flr], spicebush (*Lindera benzoin*) [frt], American witchhazel (*Hamamelis virginiana*) southern arrowwood (*Viburnum dentatum*), ornamental cherry (*Prunus* sp.), wingstem (*Verbesina alternifolia*), catbrier (*Smilax glauca*), black cherry (*Prunus serotina*), basswood (*Tilia americana*), black gum (*Nyssa sylvatica*) – abundant, some quite large (>1.5' DBH), clustered blacksnakeroot (*Sanicula odorata*) [flr/frt], wood sorrel (*Oxalis* sp.), star sedge (*Carex radiata*) [frt], privet (*Ligustrum* sp.), Christmas fern (*Polystichum acrostichoides*), blisterwort (*Ranunculus recurvatus*) – also called 'hooked

buttercup' [flr/frt], foam flower (*Tiarella* cf. *cordifolia*) – likely planted [flr], Christmas berry (*Photinia villosa*), bird cherry (*Prunus avium*) [frt], dandelion (*Taraxacum officinale*) – in the woods; wild ginger (*Asarum canadense*), columbine (*Aquilegia* sp.) – looks like *canadensis*, but with larger flowers [this was also flowering on 5/20, as per Tom Witmer], hawthorn (*Crataegus* sp.), umbrella magnolia (*Magnolia tripetala*) [flr] – abundant, some quite large (>30' tall), wood sedge (looked liked *Carex blanda* – in *laxiflorae* group) – wide leaves, Japanese angelica tree (*Aralia elata*), wild geranium (*Geranium maculatum*) [flr], spinulose woodfern (*Dryopteris carthusiana*), false Solomon's seal (*Maianthemum racemosum*), redbud (*Cercis canadensis*), black oak (*Quercus velutina*), sensitive fern (*Onoclea sensibilis*), Indian strawberry (*Duchesnea indica*), nailwort (*Paronychia* sp.) – in rocky area – we also saw an American toad here; dewberry (*Rubus hispidus*) [flr], New York fern (*Thelypteris novaboracensis*), chestnut oak (*Quercus prinus*), beechdrops (*Epifagus americana*), white oak (*Quercus alba*), mayflower (*Maianthemum canadense*), mountain laurel (*Kalmia latifolia*) [flr], rattlesnake root (*Prenanthes* sp.), Japanese knotweed (*Fallopia japonica*), silvery glade fern (*Deparia acrostichoides*), mapleleaf viburnum (*Viburnum acerifolium*) – flower buds; mockernut hickory (*Carya tomentosa*), bitternut hickory (*Carya cordiformis*), black birch (*Betula lenta*), bloodroot (*Sanguinaria canadensis*) [frt], mayapple (*Podophyllum peltatum*) [flr – end], small flower crowfoot (*Ranunculus abortivus*) [frt]

On trail leaving wooded area

Honewort (*Cryptotaenia canadensis*), chickweed (*Stellaria media*) [flr], ivyleaf veronica/speedwell (*Veronica hederifolia*), curly dock (*Rumex crispus*), Japanese hops (*Humulus japonicus*), black locust (*Robinia pseudoacacia*) [flr], vetch (*Vicia* sp.) [flr]

Near field – forest edge

Curly dock (*Rumex crispus*) [flr], cutleaf blackberry (*Rubus laciniatus*), honey locust (*Gleditsia triacanthos*) [flr] – one is armed; garden cress (*Lepidium sativum*) – very large fruits (>5mm), tree of heaven (*Ailanthus altissima*), lambsquarters (*Chenopodium album*), buttercup (*Ranunculus bulbosus*) [flr] w/ recurved sepals – in lawn, also, apparently, called “St. Anthony's turnip”

The area close to Henry Avenue is heavily dominated by red maple, with interspersed tulip poplar. Farther in, it is beech and oak (red, black, white, chestnut), with quite a bit of cherry, and black gum is common with location it being abundant.

Attendance: 4. Report by trip leader: David Hewitt.

28 May (Thursday): Center City Philadelphia, Philadelphia County, Pennsylvania.

No report recieved.

30 May (Saturday): Franklin Parker Preserve, Burlington County, New Jersey.

No report recieved.

06 June (Saturday): Bethayres Swamp, Montgomery County, Pennsylvania.

No report recieved.

07–11 June (Sunday–Thursday): Joint Field Meeting of the Botanical Society of America — Northeastern Section, Torrey Botanical Society, and Philadelphia Botanical Club. Bruce Peninsula, Ontario Canada.

The 2015 Joint Field Meeting of the Botanical Society of America — Northeastern Section, Torrey Botanical Society, and Philadelphia Botanical Club took place on June 7 through June 11, 2015 at the Bruce Peninsula in Ontario, Canada. Accommodations were at the Evergreen Resort located along the Lake Huron shoreline at the base of the Bruce Peninsula. Forty professional and amateur botanists attended, representing the states of Pennsylvania (19), New York (8), Massachusetts (3), Virginia (2), Vermont (2), Ohio (2), New Jersey (1), Connecticut (1), Florida (1) and Washington (1).

The narrow Bruce Peninsula is a continuation of the Niagara Escarpment, dolomitic limestone capping rock separates the calm sandy shores of Lake Huron from the rugged cliffs above Georgian Bay. Above these sharp cliffs lie flat dry plains called alvars, where unusual plants cope with harsh conditions. Nearby in depressions are calcareous fens, and boreal forests of balsam fir, cedar and birch. The diversity of orchids and unique habitat-specialist plants is remarkable.

On Monday, we chartered a boat to Flowerpot Island, a forested island off the tip of the peninsula, to traverse through a mossy forest and a rocky shoreline looking for orchids and limestone loving plants. On Tuesday we explored a wet sandy fen, a sand dune complex, open alvar clearings and a lake shoreline of dolomite pavement at Singing Sands. We then looked for lakeside daisy and ferns in an open jack pine forest interspersed with exposed limestone bedrock near Dyers Bay Road. On Wednesday, we explored fens, an old-growth cedar forest, sand dunes and an upland maple forest along the Red Bay/Oliphant shoreline. A small group visited Owen Sound for the unique fern flora. Our field trip leaders were Peter Middleton and Barbara Palmer of the Owen Sound Field Naturalists. Walter Muma served as field trip leader in residence.

On Monday evening, Joan Crowe introduced the “**Unique Natural History of Bruce and Grey Counties**”. Joan is a biologist with a working knowledge of geology, ecology, and bryology. As chair of the Owen Sound Field Naturalists Bruce-Grey Plant Committee, Joan edited, helped write and coordinated the production of the six natural history books published by the club. On Tuesday evening, Peter Middleton presented “**Plants the Dinosaurs Knew**”. Peter is a retired outdoor education teacher and respected field ornithologist who has guided many groups to many areas of the globe to observe birds, animals and plants. He has served as President of the Owen Sound Field Naturalists. Walter Muma presented “**Orchids of Grey-Bruce**” on Wednesday evening. Walter is a dedicated and knowledgeable naturalist, pursuing a comprehensive self-study program of Ontario’s native trees, shrubs, and wildflowers. He has served on the Board of Directors of both the Hamilton Naturalists Club and the Kitchener-Waterloo Field Naturalists Club.

Attendance: 40. Report by: Loree Speedy, Botanical Society of American Field Trip Chair Person.

13 June (Saturday): Coventry Wood Preserve, Montgomery County, Pennsylvania.

On Saturday morning, June 13th, four DVFWS members and three Philadelphia Botanical Club members met at the northern parking lot on St. Peter’s Road to explore portions of the 660 acre Coventry Wood Preserve. The preserve is presently owned by North Coventry Township and includes large areas of woodland that formerly provided charcoal to the local iron smelting industry. It also includes land that belonged to a church-affiliated camp at

which Tom and Janet Whitefield's daughter Karen participated in years past. Many of the camp buildings are still located in the area where we began our walk. The day promised to be hot, but with high woodland shade, fairly low humidity and a cool breeze it turned out to be quite pleasant. Initially we explored a trail along a moist stream near the parking lot, and then we followed an uphill trail, Fernbrook Lane, toward the south, climbing slowly as we botanized, until we reached a bench on Chestnut Hill trail where it joins Love Valley trail to the east, and we "re-hydrated." We then headed downhill to the east on Love Valley trail. The online map of the park is inaccurate with regards to the Love Valley trail, but the map posted by the parking area is accurate and shows how that trail has been expanded. Coming downhill on Love Valley trail we descended off-trail into a moist ravine where the cinnamon ferns were so huge that we thought we might have time travelled back to the Jurassic. I made certain that the other participants were always ahead of me just in case!

We identified 83 flowering plant species representing 45 distinct families and 18 fern related species.

Actaea sp., *Amelanchier* sp., *Amphicarpaea bracteata*, *Aralia nudicaulis*, *Arisaema triphyllum*, *Asimina triloba*, *Asplenium platyneuron*, *Athyrium filix-femina*, *Betula lenta*, *Botrychium virginianum*, *Carpinus caroliniana*, *Castanea dentata*, *Chimaphila maculata*, *Chrysosplenium americanum*, *Circeaea* sp., *Collinsonia canadensis*, *Conopholis americana*, *Cornus florida*, *Cypripedium acaule*, *Dendrolycopodium obscurum*, *Dennstaedtia punctilobula*, *Desmodium* sp., *Dioscorea villosa*, *Diphasiastrum digitatum*, *Dryopteris carthusiana*, *Dryopteris intermedia*, *Dryopteris marginalis*, *Epifagus virginiana*, *Eurybia divaricata*, *Fraxinus* sp., *Galium circaezans*, *Geranium maculatum*, *Geum* sp., *Goodyera pubescens*, *Hamamelis virginiana*, *Houstonia* sp., *Impatiens* sp., *Kalmia latifolia*, *Lindera benzoin*, *Lonicera japonica*, *Lysimachia quadrifolia*, *Maianthemum canadense*, *Maianthemum racemosum*, *Medeola virginiana*, *Melampyrum lineare*, *Microstegium vimineum*, *Mitchella repens*, *Monotropa uniflora*, *Morus* sp., *Nyssa sylvatica*, *Onoclea sensibilis*, *Osmorhiza* sp., *Osmunda claytoniana*, *Osmunda regalis* var. *spectabilis*, *Osmundastrum cinnamomeum*, *Parathelypteris noveboracensis*, *Parthenocissus quinquefolia*, *Persicaria arifolia*, *Persicaria virginiana*, *Phegopteris hexagonoptera*, *Pilea pumila*, *Pinus strobus*, *Polygonatum biflorum*, *Polystichum acrostichoides*, *Populus* sp., *Potentilla indica*, *Prunella vulgaris*, *Prunus* sp., *Quercus alba*, *Quercus montana*, *Quercus velutina*, *Ranunculus abortivus*, *Rubus* sp., *Sambucus* sp., *Sassafras albidum*, *Smilax glauca*, *Symplocarpus foetidus*, *Thalictrum* sp., *Uvularia perfoliata*, *Vaccinium stamineum*, *Veratrum viride*, *Veronica officinalis*, *Viburnum acerifolium*

Attendance: 7. Report by the leader: David Lauer.

20 June (Saturday): Belleplain State Forest, Cape May and Cumberland Counties, New Jersey. No report recieved.

21 June (Sunday): Manumuskin and Tuckahoe Rivers and Muskee Creek watersheds, Atlantic and Cumberland Counties, New Jersey. Joint Trip with the Torrey Botanical Society.

This trip began in the Tuckahoe River watershed at Aetna Furnace in Atlantic Co. The furnace ceased operations in 1832. Currently, the site is wooded and the furnace area is now dominated by non-native invasives, including *Lonicera japonica* and *Microstegium vimineum*. This area once (as late as the 1990s) supported an excellent population of *Liparis liliifolia*, with thousands of plants present. However, the population observed during the

trip consisted of only a few dozen plants (few in bloom), the population no doubt impacted by succession and the spread of invasive species. A few specimens of the rare *Ophioglossum pusillum* were also observed. *Pyrola rotundifolia* var. *americana*, a species that in the past was abundant at this site was not noted, it likely being lost to the succession and the spread of the invasives. The open roadsides adjacent to the road leading to Aetna Furnace had good populations of *Carex complanata* and *C. swanii*, both species belonging to *Carex* sect. *Virescentes* Kunth.

The next stop of this trip was the Middle Branch of the Muskee Creek in eastern Cumberland Co. In an open, swampy, boggy wetland under a power line right-of-way the group observed excellent stands of *Pogonia ophioglossoides* in full bloom. The group also got to see material of two closely-related nut-rushes, the rare *Scleria minor* and the more common *Scleria triglomerata*, the latter occurring in drier areas along the powerline cut. Other species noted here included *Andropogon glomeratus*, *Carex folliculata*, *C. lurida*, *C. stricta*, *C. striata*, *Dicanthelium mattamuskeetense*, *Drosera intermedia*, *D. rotundifolia*, *Dulichium arundinaceum*, *Eleocharis tuberculosa*, *Eriophorum virginicum*, *Gaylussacia dumosa*, *Juncus acuminatus*, *J. canadensis*, *J. debilis*, *J. pelocarpus*, *J. scirpoides*, *Lobelia nuttallii*, *Lycopodiella alopecuroides*, *L. appressum*, *Lyonia ligustrina*, *Rhexia mariana*, *R. virginica*, *Rhynchospora alba*, *R. capitellata*, *R. chalarocephala*, *R. macrostachya*, and *Scirpus cyperinus*. The rare *Croton wildenowii* was frequent in the open upland areas along the power line, along with *Andropogon virginicus*, *Baptisia tinctoria*, *Chrysopsis mariana*, *Lespedeza repens*, *Polygala nuttallii*, *Schizachyrium virginicum*, and *Tephrosia virginica* (in bloom).

An Atlantic white cedar swamp (*Chamaecyparis thyoides*) was then explored south of the powerline right-of-way. Here the group saw what is possibly the third largest *Chamaecyparis thyoides* in the state, measuring 10'4" in circumference (39.5" diameter) at breast height. In 2001 this same tree was measured to be just under 10'1" (see G. Moore in T. Gordon in *Bartonia* 62: 119. 2004; the current New Jersey Forest Service Champion Big Tree Register reports as champion a tree 11' in circumference from Pemberton, Burlington Co.). Other species noted in the swamp included the rare *Chionanthus virginicus* and *Smilax laurifolia*, as well as *Acer rubrum*, *Carex atlantica* var. *atlantica*, *C. collinsii*, *C. howei*, *Clethra alnifolia*, *Dichanthelium ensifolium*, *Kalmia latifolia* (extensive stands), *Magnolia virginiana* (in bloom), *Nyssa sylvatica*, *Rhododendron viscosum* (in bloom), and *Trientalis borealis*.

The group then visited the nearby DeCarlo Lots in Estell Manor. The DeCarlo Lots are a curious piece of South Jersey history, noted poet and Millville native Anne Waldman writing a poem "The DeCarlo Lots" in 1966. There are many such tracts in the region, named for Christopher DeCarlo of Newark, who owned many of them and subdivided the land into tiny (largely undevelopable) lots that would be sold cheaply (see W. McKelvey in *Press of Atlantic City*. 25 Dec. 2011). The full details of this particular tract can be found in *Imbesi v. Internal Revenue Commissioner* (U.S. Tax Court, Docket No. 8522-77, 2 Sep. 1981), the Estell Manor Imbesi family founding the 7-Up Bottling Company of Philadelphia in the 1930s (see C. Mote, *Hidden City Philadelphia*, 22 Nov. 2013). The group lunched in the tract exploring near two of the few homes ever built in the tract. Both are now abandoned; one was completely underground but had electricity. The woodlands in the planned development are a mix of *Pinus echinata*, *P. rigida*, and *P. virginiana*, the last forming solid stands in places. A small stand of the rare *Desmodium laevigatum* was observed along one roadside.

Along the eastern edge of the tract a young *Chamaecyparis thyoides* swamp in the Nixon Branch was explored. The swamp has numerous corduroy roads, evidence of the harvesting

of the cedar many decades ago. One cedar that was spared the axe measured 10'10" in circumference (40.4" diameter), making it the second largest cedar in New Jersey. In 1992, this tree was measured to be approximately 9'6" in circumference (see G. Moore in *Bartonia* 58: 151. 1994). Some of these old large cedars have been cored, the ring patterns possibly assisting researchers who are trying through dendrochronology to more accurately date the only known surviving 17th century Swedish granary, currently in Greenwich Twp. in western Cumberland Co. (in 1975, it was moved from its original location in the Dutch Neck area of Hopewell Twp., in Cumberland Co.; see T. Barlas in *Press of Atlantic City*, 15 Feb. 2014; J. Mathews, *Cumberland Patriot*, Summer 2014). Near the large tree was an open pond; species noted in the pond included *Brasenia schreberi*, *Scirpus subterminalis*, and *Utricularia striata* (in bloom).

The next stop was a recently burned pine oak woodland in the Manumuskin River watershed northeast of the town of Cumberland. The slightly moist woodland trail that was explored was dominated by *Chasmanthium laxum*, with excellent stands of *Scleria triglomerata* and *Viola lanceolata*. The highlight was seeing a few specimens of the rare *Amianthium muscitoxicum* in bloom, the flowers changing from white to green with age (see Moore et al. in *Bartonia* 68: 23. 2016 for a further discussion of this population). Also noted in bloom was a single specimen of *Calopogon tuberosus* and stands of *Polygala lutea*. Other species noted included *Lyonia mariana* (in bloom), *Eubotrys racemosa* (in bloom), *Panicum verrucosum*, *Rhynchospora capitellata*, and *R. torreyana*. In drier areas along the trail *Sericocarpus asteroides* and *S. linariifolius* were both observed in early bloom.

The group made a quick stop at Cumberland Pond where in the open field adjacent to the pond a large stand of blooming *Opuntia* was reviewed. Generally, only one species of *Opuntia*, *O. humifusa*, has been recognized from southern New Jersey (see Hanks and Fairbrothers in *Bull. Torrey Bot. Club* 96: 592–594). However, in the past (e.g., I.C. Martindale in *Bull. Torrey Bot. Club* 6: 105–106. 1876) and more recently (e.g., Majure et al. in *Phytotaxa* 290: 1–65. 2017) two species have been recognized, *O. humifusa* (*O. rafinesquii* in historical literature), with cladodes spineless and not readily disarticulating, and *Opuntia mescantha* subsp. *mescantha* (*O. vulgaris* in historical literature), with cladodes spined and readily disarticulating. The material at the site was varied, most of it keying to *O. mescantha* subsp. *mescantha* but some being referable to *O. humifusa*.

Three hardy souls persisted for the day's final stop. The trio traveled north of Cumberland Pond just W of the Manumuskin River, near the confluence of the Canute Branch with the Manumuskin River. The area explored appears on the USGS quadrangle map (Five Points) as a forested swamp. However, the sharp eye of local explorer Al Shuemate noted a small island inside this swamp that was not shown as swamp (i.e., the crow's feet that indicate wetlands were missing) on the topo map. This "island" is a dry, open, sandy woodland dominated by typical pinelands upland vegetation, such as *Cypripedium acaule*, *Eubotrys racemosa*, *Gaultheria procumbens*, *Gaylussacia baccata*, *G. frondosa*, *Hudsonia ericoides*, *Lyonia mariana*, *Pinus rigida*, *Quercus ilicifolia*, *Q. marilandica*, *Q. stellata*, *Q. velutina*, *Smilax glauca*, *S. rotundifolia*, and *Vaccinium pallidum*. Of particular note was an extensive stand of *Xerophyllum asphodeloides* (in late bloom) with over two hundred flowering stems. *X. asphodeloides* is exceptionally rare in Cumberland County, with only a handful of populations (most do not bloom) currently known from the Manumuskin, Menantico, and Maurice River watersheds.

Attendance 11. Report by leaders: Uli Lorimer and Gerry Moore.

11 July (Saturday): Whittingham Wildlife Management Area, Sussex County, New Jersey.

No report recieved.

25 July (Saturday): Hampton-Central Ponds, Wharton State Forest, Burlington County, New Jersey.

It was the revered botanical team of the brothers Frank and Bob Hirst who discovered New Jersey's first population of *Dichanthelium hirstii* (Swallen) Kartesz in an Atlantic County pond off Leipzig Avenue near Germania in July, 1958. On 17 July, 2004, R. Juelg and T. Gordon (today's leader) discovered only the third state occurrence of the Hirst Brothers' Panic Grass in a large, coastal plain, intermittent pond. Gordon named this basin "Hampton-Central Pond," since it was near the sites of historic Hampton Furnace and the abandoned tracks of the Jersey Central railroad. When Frank Hirst (personal correspondence, Dec. 2004) congratulated him on his co-discovery, it was learned that the Hirst brothers had explored this pond in the late 1950s but failed to find the rare grass. The brothers named the site "Airplane Pond" on having been alerted to it by their friend Cy Leisy, who flew over it while serving in the army. Frank's "New Jersey Field Notes," which were gifted by him to Gordon in 2008, are devoid of any documentation of species the brothers recorded at this station. Regrettably, this "loss" prevents the comparison of species observed in the late 1950s with those currently on site.

Our botany group assembled at Carranza Memorial in Wharton State Forest, consolidated into fewer vehicles, and drove to our starting point at the site of Hampton Furnace. Here we began a hike of > 1 mile south to the ponds through pitch pine lowland and a sliver of pine-oak upland. An asterisk (*) following a species indicates a plant in flower.

Species Observed Trailside & in Open Woods to the Ponds

Trees: *Ilex opaca*, *Pinus echinata*, *P. rigida*, *Quercus ilicifolia*, *Q. marilandica*, *Q. stellata*,
Shrubs: *Clethra alnifolia**, *Eubotrys racemosus*, *Gaultheria procumbens*, *Gaylussacia baccata*, *G. frondosa*, *Hudsonia ericoides*, *H. tomentosa*, *Ilex glabra*, *Kalmia angustifolia*, *K. latifolia*, *Lechea racemulosa*, *Leiophyllum buxifolium*, *Lyonia mariana*, *Pyxidanthera barbulata*, *Smilax glauca*, *S. rodundifolia*, *Vaccinium corymbosum* s.l., *V. pallidum*;
Herbs: *Apocynum androsaemifolium*, *Hypericum canadense**, *Polygonella articulata*, *Rhynchospora capitellata*, *Utricularia subulata**, *Xerophyllum asphodeloides*, *Xyris torta*;
Grasses: *Panicum rigidulum* var. *pubescens* (= *Coleataenia longifolia* ssp. *longifolia*), *Schizachyrium scoparium*; **Ferns:** *Pteridium aquilinum*.

Both the leader and/or PBC colleagues have made frequent monitoring trips to the Hampton-Central Ponds (a cluster of 3 ponds). We were hoping for water drawdown that would facilitate our search for species not previously recorded. However, the water level was relatively high (about 14"–15") over much of the area of South Pond. We recognized about 20 species we had observed here on prior visits and added the following new sightings: *Bartonia paniculata*, *Carex livida*, *C. striata*, *Drosera intermedia**, *Eriocaulon decangulare**, *Polygala brevifolia**, and *Triadenum virginicum*.

In a slightly elevated corridor leading from South Pond to Hampton-Central (Big) Pond we noted *Andropogon glomeratus*, *Aronia arbutifolia*, *Bartonia virginica*, *Gaylussacia dumosa* var. *bigeloviana*, *Ilex glabra*, *Lobelia nuttallii**, *Morella heterophylla*, and *Pogonia ophioglossoides*.

The water level of **Hampton-Central (Big) Pond** was about 17" over much of its surface. Where the water was clear and more shallow, we observed in a quick survey a ½ dozen basal rosettes and about 8 wispy culms of the rare *Dichanthelium hirstii* barely projecting above the surface. Among the new species found here, were *Eleocharis microcarpa*, *E. tenuis*, *Lycopodiella alopecuroides*, *Sarracenia pupurea*, *Scirpus cyperinus*, *Vaccinium macrocarpon*, and *Woodwardia areolata*. At the upper end of the pond on slightly higher ground occurred an impressive stand of > 50 saplings and young trees of *Diospyros virginiana*. (For additional description of these habitats and their associated species refer to the trip leader's write-ups in *Bartonia* No. 63: 17 July 2004, 62–63, 2006 and No. 65: 4 August 2007, 132–135, 2011.)

A final stop was made south of the site of Hampton Furnace **along the Central Jersey Railroad tracks and adjacent pitch pine lowlands and maple wetlands** severely disturbed by ATVs. Here the following species were recorded: *Cyperus dentatus*, *Eleocharis microcarpa*, *Fimbristylis autumnalis*, *Rhynchospora capitellata*, *R. chalarocephala*, *Panicum verrucosum*, *P. virgatum*, *Juncus biflorus*, *Apocynum cannabinum*, *Baptisia australis** (fide Janet Novak), *Centaurea stoebe* ssp. *micranthos** (= *C. biebersteinii*), *Drosera filiformis*, *Hypericum hypericoides**, *H. gentianoides*, *Monotropa hypopithys**, *Osmundastrum cinnamomeum*, *Polygala cruciata**, *P. nuttallii**, *Rhexia virginica**, *Rhus copallinum*, *Sagittaria engelmanniana**, *Solidago odora*, *Utricularia geminiscapa**, *Viola lanceolata*, and *Xyris difformis*.*

Thanks are extended to Janet Novak for her considerable contributions to the list of species observed.

Attendance: 18. Report by leader: Ted Gordon.

27 July (Monday): Delhaas Woods, Bucks County, Pennsylvania.

Delhaas Woods is probably Pennsylvania's most intact coastal plain site, and it is home to a large number of state-listed plants. We went through wet woods, wet and dry meadows, and bogs. We were lucky enough to catch *Lilium superbum* (Turk's cap lily) in bloom. The most notable find was *Lysimachia hybrida* (lanceleaf loosestrife), which is classified as threatened in Pennsylvania. The wet meadow had approximately 50 plants, many of them in flower. To my knowledge, this species has not been reported before at Delhaas, and in particular it was not reported in the comprehensive survey of Poster et al (Poster, Lauren S., Ann F. Rhoads, and Timothy A. Block. "Vascular flora and community assemblages of Delhaas Woods, a coastal plain forest in Bucks County, Pennsylvania." *The Journal of the Torrey Botanical Society* 140, no. 1 (2013): 101–124).

Plants in bloom were *Apios americana*, *Apocynum cannabinum*, *Asclepias incarnata*, *Boehmeria cylindrica*, *Calystegia sepium*, *Cephalanthus occidentalis*, *Chamaecrista nictitans*, *Coronilla varia*, *Cuscuta* sp., *Daucus carota*, *Desmodium* sp., *Galium mollugo*, *G. obtusum*, *Geum canadense*, *Gratiola aurea*, *Hackelia virginiana*, *Hypericum canadense*, *Hypochaeris radicata*, *Impatiens capensis*, *Lilium superbum*, *Lobelia inflata*, *Ludwigia alternifolia*, *Lycopus* sp., *Lysimachia hybrida*, *Lythrum salicaria*, *Melilotus albus*, *M. officinalis*, *Mimulus ringens*, *Monotropa uniflora*, *Penthorum sedoides*, *Polygala nuttallii*, *P. sanguinea*, *Polygonum hydropiperoides*, *Sabatia angularis*, *Spiraea alba*, *S. tomentosa*, *Strophostyles umbellata*, and *Verbena hastata*. Other plants recorded were *Acer negundo*, *Acer rubrum*, *Ailanthus altissima*, *Alisma* sp., *Alliaria petiolata*, *Andropogon glomeratus*, *Andropogon virginicus*, *Arisaema triphyllum*, *Aronia melanocarpa*, *Asclepias syriaca*, *Asplenium platyneuron*, *Betula lenta*, *B. nigra*, *B. populifolia*, *Bidens* sp., *Carex intumescens*, *Carex stricta*, *Circaea lutetiana*, *Cirsium arvense*, *Cornus* sp. (shrub), *Cryptotaenia canadensis*, *Danthonia*

sericea, *Decodon verticillatus*, *Dennstaedtia punctilobula*, *Dichanthelium scoparium*, *Dioscorea villosa*, *Diospyros virginiana*, *Diphasiastrum digitatum*, *Dryopteris carthusiana*, *D. intermedia*, *Eleocharis acicularis*, *E. olivacea*, *Equisetum arvense*, *Eragrostis spectabilis*, *Euonymus alatus*, *Eupatorium dubium*, *E. hyssopifolium*, *E. pilosum*, *E. rotundifolium* var. *ovatum*, *E. serotinum*, *Euthamia graminifolia*, *Fraxinus americana*, *Gentiana saponaria*, *Heteranthera* sp. (probably *H. reniformis*), *Ilex opaca*, *Juniperus virginiana*, *Krigia biflora*, *Lindera benzoin*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Lonicera japonica*, *Lycopodiella appressa*, *Lyonia ligustrina*, *Lysimachia quadrifolia*, *L. terrestris*, *Magnolia tripetala*, *Maianthemum canadense*, *Microstegium vimineum*, *Nyssa sylvatica*, *Onoclea sensibilis*, *Osmunda cinnamomea*, *Panicum rigidulum*, *Parthenocissus quinquefolia*, *Penstemon digitalis*, *Phragmites australis*, *Phytolacca americana*, *Polygonum cuspidatum*, *P. perfoliatum*, *P. sagittatum*, *P. virginianum*, *Proserpinaca palustris*, *Pteridium aquilinum*, *Quercus phellos*, *Frangula alnus* (syn. *Rhamnus frangula*), *Rhododendron viscosum*, *Rhus copallinum*, *R. typhina*, *R. vernix*, *Rhynchospora capitellata*, *Rosa multiflora*, *R. palustris*, *Sambucus canadensis*, *Scirpus cyperinus*, *Scutellaria integrifolia*, *Smilax glauca*, *Smilax rotundifolia*, *Solidago juncea*, *Solidago nemoralis*, *Solidago rugosa*, *Strophostyles helvola*, *Symplocarpus foetidus*, *Toxicodendron radicans*, *Tragopogon* sp., *Triadenum virginicum*, *Uvularia sessilifolia*, *Vaccinium fuscatum*, *Vernonia noveboracensis*, *Viburnum dentatum*, *Viburnum prunifolium*, and *Viola brittoniana*.

Attendance: 23. Report by the leader: Janet Novak.

08 August (Saturday): Basic Fern Identification Workshop at Pennypack Ecological Restoration Trust, Montgomery County, Pennsylvania. Joint event with the Delaware Valley Fern and Wildflower Society.

This workshop emphasized the common ferns of southeast Pennsylvania. We covered 20 species:

1. *Adiantum pedatum* (maidenhair fern)
2. *Asplenium platyneuron* (ebony spleenwort)
3. *Athyrium filix-femina* (lady fern)
4. *Dennstaedtia punctilobula* (hayscented fern)
5. *Deparia acrostichoides* (silvery glade fern)
6. *Dryopteris carthusiana* (spinulose woodfern)
7. *Dryopteris intermedia* (intermediate woodfern)
8. *Dryopteris marginalis* (marginal woodfern)
9. *Matteuccia struthiopteris* (ostrich fern)
10. *Osmunda cinnamomea* = *Osmundastrum cinnamomeum* (cinnamon fern)
11. *Osmunda claytoniana* (interrupted fern)
12. *Osmunda regalis* (royal fern)
13. *Onoclea sensibilis* (sensitive fern)
14. *Phegopteris connectilis* (long beech fern, uncommon in the Delaware Valley, but common in the Poconos and points further north)
15. *Phegopteris hexagonoptera* (broad beech fern)
16. *Polypodium* species (polypody ferns, *P. virginianum* and *P. appalachianum*—we did not attempt to distinguish these two species)
17. *Polystichum acrostichoides* (Christmas fern)
18. *Pteridium aquilinum* (bracken)

19. *Thelypteris noveboracensis* (New York fern)
20. *Thelypteris palustris* (marsh fern)

The workshop covered the characteristics that can be used to distinguish those species. Often, only two or three characters are enough for a definitive ID. For the second half of the event, we hiked the Pennypack Trust's trails and practiced fern identification. We saw all of the ferns taught except *Polypodium* sp., the two *Phegopteris* species, and the three *Osmunda* species. We also saw two less common ferns: *Dryopteris cristata* (crested woodfern) and *Pellaea atropurpurea* (purple-stemmed cliffbrake). Thanks go to the Pennypack Trust for providing space for the workshop.

Attendance: approximately 15. Report by the leader: Janet Novak.

15 August (Saturday): Intermittent Big Goose Pond and Little Goose Pond, Atlantic County, New Jersey.

It was from the late Louis E. Hand and Alfred "Ernie" Schuyler that the leader learned (early 1970s) of the brothers Bob and Frank Hirst's passion for exploring intermittent ponds and sphagnum wetlands. In August 2008, the leader was both surprised and honored when Frank Hirst mailed his "New Jersey Field Notes" to him, believing that he would find them useful by serving as encouragement to revisit and update our knowledge of many of the sites the Hirst brothers had popularized. Frank's notes have provided the basis for the leader's short botanical exploration history of Big Goose and Little Goose Ponds, two of the state's most significant examples of a Coastal Plain intermittent pond.

On a cold, windy January 29, 1955, the Hirst brothers, engaged in duck watching, located and explored ice-covered **Big Goose Pond** southwest of Egg Harbor City. The brothers returned to this shallow basin specifically to botanize on July 29, 1956, a miserable, rainy day when the pond was flooded to about 20 inches. Frank noted, "The only noteworthy plant seen was *Rhynchospora inundata*." In contrast, their visit during a drought period on July 20, 1957 proved to be bountiful. "The pond was dry and the bottom only moist in a few places." It abounded in a golden stand of *Xyris congdoni* (i.e., *X. smalliana*[^]) and contained *Rhynchospora inundata* in widely scattered locations. Among other typical species recorded were *Utricularia cornuta*[^], *U. striata*[^], *Eleocharis robbinsii*[^], *Dichanthelium spretum*[^], *Rhynchospora fusca*, *Lycopodiella alopecuroides*, *Lachnanthes caroliniana*, and *Rhexia virginica*.

The brothers next followed two deep fire-cut ditches through a cedar-hardwood stand that led them to **Little Goose Pond** (their first visit), which had 2–4 inches of water. Here they recorded *Gratiola aurea*, *Juncus militaris*, the five above species marked with a caret ([^]), and rarities such as a single specimen of *Utricularia resupinata*, about two dozen plants of *Sagittaria teres*, a state record (W. Stone, 1911, *The Plants of Southern New Jersey*, cites: "J.G. Smith records *S. teres*, N.J. Pine Barrens, Torrey, 1833." However, no specimen exists.), and a "sizeable colony" of the showy *Rhexia aristosa* "in the northeast end of the pond." Rediscovery of the latter species, awned meadow beauty, was a highlight. It was originally discovered by E.H. Kilmer and John C. Gifford in August, 1888 at nearby Egg Harbor City and at only one other station near Cologne by C.F. Saunders on August 21, 1898 (W. Stone, 1911). Since that time its whereabouts had remained a mystery.

On their return to a much drier Little Goose Pond on August 4, 1957, the brothers, "found a legion of *Rhexia aristosa* blooming" and noted that *Sagittaria teres* was more abundant than first thought. They discovered what later proved to be the state's lone

occurrence of the diminutive *Utricularia olivacea*, occupying “soft mud and wet brown algae in about 5 spots of the north end of the pond.” (See Ruth McV. Allen’s “A Study of *Utricularia olivacea*” in *Bartonia* No. 29: 1, 1959 & William A. McAvoy’s “Remembering Frank Hirst and His Recollection of the Discovery of *Utricularia olivacea* in New Jersey” In *Bartonia* No. 65: 112–114, 2011.) Their August 29 survey yielded “*Scleria reticularis* in abundance around the edges.” On June 26, 1958, Little Goose contained about 20” of water in the deepest spots. *Utricularia fibrosa* (i.e., *U. striata*) was added to the list and an abundant panic grass was keyed to *Panicum hemitomon*, previously known only from Bennett Bogs. Projecting through the water, *Rhexia aristosa* was “all over the east end.” When Frank returned with J. Albert Starkey and his son to search for frogs on a rainy July 9, 1958 evening, they found *Rhynchospora fusca* in the southern corner. On August 10, 1958, Dave Fables, Lou Hand, Al Starkey, and George Nichols (Nichlas?) accompanied the brothers to see *Rhexia aristosa* and other rarities of Little Goose Pond (flooded to ca. 20”). “Very, very pleased to see *Lobelia boykinii* in the eastern part of the pond.” Fables found it here earlier while doing a survey under a grant. The team added *Rhynchospora inundata* to the pond list but saw no small bladderworts.

On a highly significant visit to Little Goose Pond on October 26, 1958, the Hirsts convinced Robert Perkins, the founding Trustee of Wildlife Preserves, Inc. of the need to preserve this site (and later Big Goose Pond as well) to prevent its destruction by a blueberry grower (See Edgar T. Wherry’s “Goose Pond Saved” in *Bartonia* No. 29: 2, 1959.) Three trips in June, 1959 failed to relocate *Utricularia resupinata*. When the Pine Barren Conservationists convened on August 9, 1959 to admire the special plants of both ponds, the awned meadow beauty had not yet been observed at Big Goose Pond. On the following day the Hirsts, Vince Abraitys, Dot Everett, Dave Fables, Annie Carter, and Bayard Long roamed around both ponds looking at the diversity of species. “Mr. Long took many specimens and marveled at the pond’s flora.” The main attraction was a tiny, white-flowering bladderwort “blooming in a few spots where it was exposed on moist bottoms. The tiny strings of leaves were everywhere, floating in the northwest end of Little Goose Pond.” All were bearing tiny scattered bladders and tiny buds that Frank believed would flower with a drop in water level. Not one of the botanists could name this plant. On August 18, Frank took Ruth Allan to this pond to collect specimens of the tiny unidentified bladderwort. She was planning to describe it as a new species under the name of *Utricularia hirstorum* in honor of the Hirst brothers (See the McAvoy reference cited above). Regrettably this rare plant was not new to science.

Frank’s New Jersey Field Notes concluded with an unrelated entry for April 29, 1962. For the years 1960 through 1962 there occurred only a single entry that pertained to Big Goose Pond: October 4, 1961 “— long walk — Nothing new. *Eleocharis equisetoides* very luxuriant.” A random note of plant records for August 21, 1963 records that Bob and Frank collected *Myriophyllum tenellum* in Little Goose Pond.

On our 2015 field trip to these popular intermittent ponds, the leader provided the participants with an oral summary of excerpts from the more comprehensive early exploration history of these enigmatic habitats cited above. Our primary focus was the re-discovery of *Lobelia boykinii*, *Utricularia olivacea*, *U. resupinata* and other bladderworts, and *Eleocharis equisetoides*. We entered Big Goose Pond from its northwestern border via a severely flooded canal and traversed the central basin in an eastern to southeastern arc. The general depth of the water in both ponds was about 14–16 inches, far deeper than desired. Typical species that occupied the outer edge were *Clethra alnifolia**, *Chamaedaphne*

*calyculata**, (both in immature fruit), and *Carex striata** in mature fruit. In the latter zone were *Sphagnum cuspidatum**, *S. macrophyllum**, blooming *Nymphaea odorata**, and *Drosera intermedia* in immature fruit. Widely distributed species included *Panicum hemitomon**, fruiting *Cladium mariscoides**, flowering *Xyris smalliana**, and flowering *Eleocharis robbinsii** with filiform basal leaves. Also present were scattered plants of the reliable *Rhynchospora inundata* in fruit and, in the northeastern lobe, a fine patch of the stout, septate, terete culms of the illusive *Eleocharis equisetoides* in immature fruit. Here and there were vegetative as well as flowering pockets of both *Utricularia striata** and *U. geminiscapa**. However, *U. purpurea*, *U. cornuta*, and *Scleria reticularis* eluded us, likely as a result of recent rainfall that negatively impacted their emergence. Non-flowering specimens of *Rhexia aristosa** occupied particularly the southwestern lobe of the pond. In this vicinity were a few culms of *Panicum rigidulum* var. *pubescens* (= *Coleataenia longifolium* ssp. *longifolium*), bearing fimbriate-ciliate ligules 0.5–3mm long.

To reach Little Goose Pond we followed an old fire-cut ditch through a sphagnous *Chamaecyparis thyoides*-mixed hardwood swamp that contained *Magnolia virginiana*, *Acer rubrum*, *Ilex opaca*, *Vaccinium corymbosum* var. *caesariensis*, *Rhododendron viscosum*, *Eubotrys racemosa*, *Clethra alnifolia*, and *Woodwardia virginica**. On entering the pond we immediately searched unsuccessfully the northwestern lobe for *Utricularia resupinata*, seen here only once (a single specimen) by the Hirst brothers in July, 1957. Perhaps early June during water drawdown would be a more optimal time to search for this bladderwort. Further to the northeast, the leader conducted an intensive, though unproductive, search of more than an hour for the tiny *Utricularia olivacea*. This species likely would benefit from an extremely shallow water level. A few plants of fruiting *Eleocharis tuberculosa*, vegetative *Gratiola aurea*, and both fruiting and flowering *Proserpinaca pectinata* were present too. All species above marked with an asterisk (*) occurred in Little Goose Pond as well.

Of special note is the death on June 17, 2017 of Robert Perkins, Jr. to whom all plant enthusiasts owe a special debt of gratitude for sparing these two ponds from destruction many years ago.

Thanks go to Larry Klotz, Tom Besselman, and Terry Schmidt for their input to the list of species observed.

Attendance: 13. Report by leader: Ted Gordon.

22–23 August (Saturday and Sunday): Intermittent Ponds, Atlantic, Cape May and Cumberland Counties, New Jersey.

Participants met at Cumberland Pond where early arrivers briefly botanized an open upland field adjacent to the pond. Here the group noted the following species: *Apocynum androsaemifolium*, *Asclepias amplexicaule*, *A. tuberosa*, and *Jasione montana*. Rare species noted here were *Desmodium strictum* and *Gymnopogon ambiguus*.

The group then traveled to the Halberton (a short-lived Jewish settlement from the late 1800s) area where it visited a pond that was previously visited in 2014. The species observed were mostly the same from the 2014 trip (see *Bartonia* 68:116–117. 2016); the state-endangered *Rhynchospora filifolia* was again noted in the same location in the pond it was observed in 2014. A nearby abandoned cranberry bog was then visited, where the globally-rare *Eupatorium resinosum* was noted. Other species noted included *Bartonia paniculata*, *B. virginica*, *Carex stricta*, *Drosera intermedia*, *D. rotundifolia*, *Eriophorum virginicum*, *Eupatorium leucolepis*, *Muhlenbergia uniflora*, *Polygala brevifolia*, *P. cruciata*, *Sabbatia difformis*, *Saccharum giganteum* (= *Erianthus giganteus*), *Sagittaria engelmanniana*, and

Sarracenia purpurea. The group then traveled west along the long-abandoned railroad bed towards Halberton. Adjacent to the railroad a number of intermittent ponds were explored. All of them had the rare species *Lobelia canbyi*, as well as *Saccharum giganteum*. Other species noted in these ponds included: *Amphicarpum amphicarpon*, *Dichanthelium mattamuskeetense*, *D. spretum*, *Gratiola aurea*, *Panicum longifolium*, *Rhynchospora chalarocephala*, and *R. macrostachya*. In past years the rare *Utricularia radiata* was present in a few of these ponds; however, this year, the water levels were likely too low for this species. The group ended the day at Halberton proper where the focus was more on history than botany.

On the second day, the group visited many intermittent ponds adjacent to the abandoned railroad bed that runs between Belleplain and Woodbine. Along the RR bed the group unsuccessfully searched for a known location of the rare *Gentiana autumnalis*, the species possibly being overlooked since it is hard to spot when not in bloom. Many of the ponds visited along this stretch of the RR were not diverse botanically, a thick layer of dead, decaying leaves or stands of *Sphagnum* carpeting the ponds. Some of these ponds did have populations of the rare *Dichanthelium wrightianum*. One pond was an exception to this trend, it being dominated by the rare *Panicum hemitomom*, with the rare *Utricularia purpurea* (in bloom) being found in a small area in the center of the pond where there was some standing water. The last pond visited was in Woodbine. Rare species noted in this pond included *Dichanthelium wrightianum*, *Lobelia canbyi*, *Muhlenbergia torreyana*, *Rhynchospora cephalantha*, and *Scleria reticularis*. These rare species were also noted in a sandy wet area adjacent to the pond in a powerline right-of-way. Also observed here were stands of *Xyris difformis* and the rare *Xyris jupicai*, the perennial habit of the former and annual habit of the latter being obvious this late in the year, as *X. jupicai* was senescing. Also noted here was the rather infrequent *Edrastrum uniflora*, the species previously placed in the genera *Hedyotis* and *Oldenlandia*. Many of the pines in the area of the last stop would be referable to the rare *Pinus serotina* (or what passes for *P. serotina* in New Jersey), the needles being generally longer than *P. rigida* in the Pinelands and the cones having deciduous prickles and a more rounded base.

Attendance: 15. Report by leaders: Uli Lorimer and Gerry Moore.

18–20 September (Friday–Sunday): 39th Annual A. Leroy Andrews Foray, Pinelands Center at Mount Misery surrounded by Brendan T. Byrne State Forest, Browns Mills, Burlington County, New Jersey.

Club members were invited guests at the Andrews Foray, a group devoted to the study of mosses, lichens, and liverworts. Activities commenced on Friday at 8:00 PM with an overview, photo-illustrated program titled “The Lure of the Pine Barrens” by Ted Gordon. The focus of the lecture was the diverse botanical communities from quaking cedar bogs and pitch-pine lowlands to upland pine-oak forests and pygmy pines in their seasonal aspects. Chairperson David Austin next clarified that participants would be divided into two field teams on Saturday morning, a sphagnum moss group and a lichen group. The two would meet for lunch at the Warren Grove Gunnery Range and then botanize as a unit.

After breakfast on Saturday, Walter Bien (Drexel University) and Ted Gordon (Rutgers University) led the sphagnum group to nearby “Blue Hole” occupying a segment of the North Branch of Mt. Misery Brook, lined by *Chamaecyparis thyoides* (Atlantic white-cedar), *Acer rubrum* (red maple), and *Nyssa sylvatica* (black gum). This unique, riverine seepage swale, a mineral-poor fen, was dominated by impressive hummocks and carpets

of sphagnum dotted by pipeworts, bladderworts, sundews, foliage of three orchids (rose pogonia, grass-pink, white fringed), purple pitcher plant, golden-crest, and curly grass fern. Because of its quagmire nature, the fen was difficult to negotiate. We recorded fifteen sphagnum species at this site with *Sphagnum angermanicum* among the more infrequent (See Table 1, Mt. Misery). Until the 1990s, a local Piney was still raking sphagnum from this fen for sale to nurseries.

We drove east on SR 72 and then turned south on CR 539 to the firehouse in Warren Grove. After another 2.9 miles, we turned west onto Gunnery Range Road (dirt) for ca. 1 mile to **Watering Place Pond** in Stafford Forge Wildlife Management Area, Ocean County, the second sphagnum site. Here we recorded only two sphagnum species, the common *Sphagnum cuspidatum* and a significant occurrence of the rare *S. macrophyllum* (G5,S2). In adjacent upland, we admired large carpets of bearberry and the state endangered shrub *Corema conradii* (broom crowberry, S2,E,LP). We broke for lunch in the adjacent fenced-in Warren Grove Gunnery Range (Burlington County).

During the same morning period under the leadership of Natalie Howe (Rutgers University), Linda Kelly, and Tom Phillips, the lichen group began its independent exploration of the mature upland mixed oak-pitch pine forest (*Quercus montana*, *Q. alba* – *Pinus rigida*) on the grounds of the **Pinelands Center at Mt. Misery (Site L1)**. They continued northwest to site two in adjoining **Brendan T. Byrne State Forest (Site L2)**, a pitch-pine lowland forest near its interface with an upland community of pitch pine-blackjack oak (*Q. marilandica*) with an understory of bracken and black huckleberry, at a 1000 m north of the intersection of Norlemon and Shinn Roads. The team's third morning stop was an upland *Pinus rigida*-*Quercus marilandica* community with a *Carex* understory at the **abandoned Jersey Central railroad (Site L3)** outside of the state park to the east off Savoy Boulevard, ca. 150 m south of the railroad bridge over Route 72. The lichens recorded at these sites by the team occur in Table 2.

Both groups now teamed up at the Warren Grove Gunnery Range and after eating lunch continued to explore as a unit. Stops at large fields periodically maintained by mowing and prescribed burning adjacent to an airstrip provided a fine opportunity to see spectacular populations of the globally rare (G3) *Gentiana autumnalis* (Pine Barren gentian), the globally rare (G1) *Rhynchospora knieskernii* (Knieskern's beaked sedge), and showy members of the *Asteraceae*. Our car caravan continued north through the Range's East Pine Plains toward the Oswego River and then headed west on Warren Grove–Calico Road (dirt) to reach the remaining three sphagnum sites. **Big Bog (Site L4)** was located on the south side of the Oswego River about 750 m east of the north end of Allen Road and about 700 m west of a hunting cabin along "Predmore Ridge." The site produced 13 sphagnum species. Situated only a few hundred meters to the north and west (near Sim Place) was **Oswego Bog (Site L5)**, a magnificent savannah-nutrient-poor fen that yielded 20 sphagnum species, among them the globally rare *Sphagnum carolinianum* (G3,S2), *S. portoricense* (S2), and the infrequent *S. molle*. This unique habitat also harbored several rare vascular plants: the globally rare *Narthecium americanum* (bog asphodel, G2,S2,E,LP), *Tofieldia* (*Triantha*) *racemosa* (viscid or False asphodel, S1,E,LP), *Juncus caesariensis* (New Jersey rush, G2G3,S2,E,LP), *Asclepias rubra* (red milkweed, S2,LP), *Calamagrostis pickeringii* (Pickering's reedgrass, S1,E,LP), and *Calamovilfa brevipilis* (Pine Barren reedgrass, LP).

Table 1. Species Observed September 19–20, 2015.

Species	Mt. Misery	Watering Place Pond	Big Bog	Oswego Bog	Calico Hamlet	Webbs Mills
<i>Sphagnum affine</i>					x	
<i>Sphagnum angermanicum</i>	x				x	
<i>Sphagnum bartlettianum</i>	x		x	x	x	x
<i>Sphagnum carolinianum</i>				x		
<i>Sphagnum compactum</i>			x	x		x
<i>Sphagnum cuspidatum</i>	x	x	x	x	x	x
<i>Sphagnum cyclophyllum</i>	x		x	x		x
<i>Sphagnum fallax</i>				x		x
<i>Sphagnum fimbriatum</i>			x	x		
<i>Sphagnum flavicomans</i>	x		x	x	x	x
<i>Sphagnum lescurii</i>	x		x	x		x
<i>Sphagnum macrophyllum</i>		x			x	
<i>Sphagnum magellanicum</i>	x		x	x	x	x
<i>Sphagnum molle</i>				x		
<i>Sphagnum palustre</i>	x			x	x	
<i>Sphagnum papillosum</i>	x		x	x	x	x
<i>Sphagnum perichaetiale</i>	x		x	x		x
<i>Sphagnum portoricense</i>				x		
<i>Sphagnum pulchrum</i>	x		x	x	x	x
<i>Sphagnum pylaesii</i>	x		x	x		x
<i>Sphagnum recurvum</i>	x		x	x	x	x
<i>Sphagnum tenerum</i>	x			x	x	x
<i>Sphagnum tenellum</i>						x
<i>Sphagnum torreyanum</i>	x			x	x	
<i>Sphagnum trinitense</i>		?				

List Courtesy of Walt Bien

Our final stop, about 4.3 miles to the southwest, was an abandoned cranberry bog and reservoir associated with a mixed hardwood-cedar swamp in Beaver Branch at the former **Calico Hamlet (Site L6)** along Warren Grove-Calico Road <1 mile east of Oswego-Munion Field Road. Of 13 sphagnum species found here, only *Sphagnum cyclophyllum* (G3,S2) and *S. macrophyllum* (G5,S2) were rare and had a significant global status, two, *S. affine* and *S. angermanicum*, were infrequent. Lichens reported on pine trunk by John G. Guccion were *Parmeliopsis subambigua* and *Trapeliopsis flexuosa*.

We returned to Pinelands Center for dinner, followed by socializing and keying specimens collected.

Table 2. Lichen Species Observed on September 19 & 20, 2015.

Foliose Species	Fruticose Species	Crustose Species
<i>Candelaria concolor</i> (lemon lichen)	<i>Cetraria arenaria</i> (sand loving Iceland lichen)	<i>Hypocenomyce anthracophila</i> [?] (small clam lichen) or <i>H. scalaris</i> [?] (common clam lichen)
<i>Flavoparmelia caperata</i> (green shield lichen)	<i>Chrysothrix chamaecyparicola</i>	<i>Leconora strobilina</i> (mealy rim-lichen)
<i>Parmelia sulcata</i> (hammered shield lichen)	<i>Cladina subtenuis</i> (false reindeer lichen)	<i>Pertusaria</i> sp. (wart lichen)
<i>Parmotrema hypotropum</i> (powered ruffle lichen)	<i>Cladonia atlantica</i> (broccoli lichen)	<i>Placynthiella uliginosa</i> (tar lichen)
<i>Parmotrema reticulatum</i>	<i>Cladonia chlorophaea</i> (pixie cup)	<i>Ochrolechia pseudopallescens</i>
<i>Parmotrema stuppeum</i> (powered edge ruffle lichen)	<i>Cladonia coniocraea</i> (awl lichen)	
<i>Phaeophyscia rubropulchra</i> (orange pith lichen)	<i>Cladonia cristatella</i> (British soldier lichen)	
<i>Punctelia rudecta</i> (rough speckled shield lichen)	<i>Cladonia macilenta</i> (pin lichen)	
<i>Punctelia caseana</i> [= <i>P. subrudecta</i>] (powdered speckled shield lichen)	<i>Cladonia peziziformis</i> (turban lichen)	
<i>Tuckermannopsis fendleri</i> (dwarf wrinkled lichen)	<i>Cladonia rappii</i> (coastal plain ladder lichen)	
	<i>Cladonia uncialis</i> (thorn lichen)	
	<i>Pycnothelia papillaria</i> (nipple lichen)	
	<i>Usnea strigosa</i> (beard lichen)	
	<i>Variolaria pustulata</i>	

Additional lichens collected by J. Guccion and their site locations are as follows: Site L1–*Buellia imshaugii* (on base of pine), *Cladonia incrassata* (on base of pine), *Crespoa crozalsiana* (on oak log), and *Parmelia saxatilis* (on oak log), Site L2– *Amandinea polyspora* (on branch of hardwood shrub), *Cladonia grayi* (on ground), *Imshaugia aleurites* (on pine trunk), *Lepraria harrisiana* (on pine trunk), and *Phaeographis inusta* (on branch of hardwood shrub), Site L4–*Imshaugia placrodia* (on pine branch), and Site L5– *Cladonia didyma* var. *vulcanica* (on *Chamaecyparis* base) and *Cladonia parasitica* (on pine base).

On Sunday morning before departing for home, the lichen group explored an **Atlantic white cedar swamp along McDonalds Branch** on Butterworth Road about 100 m south of its intersection with Dry Pond Road in Brendan T. Byrne State Forest, Burlington County. Among the species observed by N. Howe were *Chrysothrix chamaecyparicola* (on bark) and three species on dead wood, *Trapeliopsis flexuosa* (board lichen), *Cladonia rappii*, and *C. ochrochlora* (smooth-footed powderhorn). The group’s final stop was a return visit to a pine-oak upland along an **abandoned railroad (Site L3)** off Savoy Boulevard north of Chatsworth (See aTable 2). Observed here by J. Guccion on Saturday were *Cladonia boryi* on a roadside bank and *Pyrrhospora placordia* on dead hardwood shrub.

During the same time period, the sphagnum group explored **Webbs Mills Bog** south of Whiting along the east side of Route 539 ca. 6.4 miles north of Route 72 in Ocean County. Known for its species diversity, this popular sphagnum bog once provided turf for charcoal burners. We gained access via a boardwalk and recorded 15 sphagnum species (Table 1, Webbs Mills). The two most significant species observed were *Sphagnum cyclophyllum* (G3,S2), and *S. tenellum* (S2). However, it was the bright golden color of the more common mats of *S. pulchrum* and the deep red hummocks of *S. tenerum* that left a memorable impression on our minds. This, too, was home to a stunning stand of yellow-orange seed capsules of bog asphodel mixed with golden-crest, rose pogonia foliage, and many carnivorous species.

By 1:00 PM the Foray came to an official end. We especially thank Dr. Richard Andrus (NYU, Binghamton) and Dr. Eric Karlin (Ramapo College of NJ) for providing their expertise in sphagnum identification in the field. We also appreciate the broad assistance of Dr. Nancy Slack and Bill Olson. We are grateful to Dr. James Lendemer for assistance with selecting lichen sites, to Dr. W. Bien and T. Gordon for selecting sphagnum sites, and to Natalie Howe for her input to site description and locality information.

Attendance: 37. Foray Chairperson: David Austin. Leaders: Ted Gordon, Walt Bien, Natalie Howe, Linda Kelly, and Tom Phillips. Report by Ted Gordon.

06 December (Sunday): Whitesbog, Burlington County, New Jersey.

Whitesbog, once the largest cranberry farm in New Jersey, is now part of the Brendan Byrne State Forest. The site is a mixture of more-or-less wild areas and former crop areas. The old cranberry bogs and blueberry orchards are still discernable but are becoming more diverse as they are reclaimed by typical Pinelands vegetation. Dike roads between the old bogs provide some interesting habitat—sunny with a sharp gradient from dry down to the wet bog. On one of these roadsides, we saw *Spiranthes cernua* and *Symphyotrichum novi-belgii* that, amazingly, still had a few flowers on this December day. *Morella pensylvanica* and *M. heterophylla* grew side by side, making for an instructive contrast. As is typical for the Pinelands, we saw very few non-native plants: just *Hypochaeris radicata* and a *Cardamine*.

The plants recorded were *Acer rubrum*, *Amelanchier* sp., *Andropogon glomeratus*, *A. virginicus*, *Aristida purpurascens*, *Aronia arbutifolia*, *Betula populifolia*, *Cardamine* sp., *Carex bullata*, *Chamaecyparis thyoides*, *Chamaedaphne calyculata*, *Chimaphila maculata*, *Chrysopsis mariana*, *Clethra alnifolia*, *Cuscuta* sp., *Cyperus dentatus*, *Decodon verticillatus*, *Dendrolycopodium obscurum*, *Diodia teres*, *Eubotrys racemosa*, *Gaultheria procumbens*, *Glyceria obtusa*, *Hudsonia ericoides*, *Hypericum canadensis*, *H. stans*, *Hypochaeris radicata*, *Ilex glabra*, *I. laevigata*, *I. opaca*, *Juncus canadensis*, *J. effusus*, *Kalmia angustifolia*, *Lachnanthes caroliniana*, *Lespedeza capitata*, *Liquidambar styraciflua*, *Ludwigia alternifolia*, *Lycopodiella alopecuroides*, *L. appressa*, *Lyonia ligustrina*, *L. mariana*, *Magnolia virginiana*, *Morella heterophylla*, *M. pensylvanica*, *Nymphaea odorata*, *Nyssa sylvatica*, *Oenothera* sp. (*Oenothera biennis*?), *Osmunda cinnamomea* (= *Osmundastrum cinnamomeum*), *Panicum virgatum*, *Polygala lutea*, *Pteridium aquilinum*, *Quercus ilicifolia*, *Q. marilandica*, *Rhexia virginica*, *Rhododendron viscosum*, *Rubus hispidus*, *Sarracenia purpurea*, *Sassafras albidum*, *Scirpus cyperinus*, *Smilax glauca*, *Solidago odora*, *Spiranthes cernua*, *Symphyotrichum novi-belgii*, *Vaccinium macrocarpon*, *Viola lanceolata*, *V. primulifolia*, *Woodwardia areolata*, and *Xyris difformis*.

Attendance: 27. Leaders: Mark Szutarski and Janet Novak. Report by the latter.

2016

02–06 June (Thursday–Monday): Allegheny Mountains of Pennsylvania, Maryland, and West Virginia. Accommodations at Camp Christian, Mill Run, Fayette County, Pennsylvania. Joint Field Meeting of the Botanical Society of America — Northeastern Section, Torrey Botanical Society, and the Philadelphia Botanical Club, joined by the Virginia Native Plant Society and the Botanical Society of Western PA.

Located in the western portion of the Appalachian Mountains, the northeast-southwest trending Allegheny Mountains consist of broad, rounded ridges (Chestnut Ridge, Laurel Mountain and Negro Mountain) separated by broad valleys. The ridges occur on the crests of anticlines that have been eroded enough to expose the very resistant sandstone that forms the crests of the ridges. The southern parts of these ridges form the highest mountains in Pennsylvania. The ridges are breached by the Youghiogheny River, as well as by Indian Creek.

We spent Friday along the Youghiogheny River in Ohiopyle State Park, a natural area with great plant diversity and scenic beauty. One of the botanical highlights of the trip was the rocky, ice- and flood-scoured flats along the Youghiogheny River and the adjacent forested slopes. The unique microclimate from a warm protected gorge and a northerly flow of the river brings about southern wildflowers found nowhere else in Pennsylvania. Large-flowered marshallia (*Marshallia grandiflora*), endemic to the Appalachians, and Carolina tassel-rue (*Trautvetteria caroliniensis*) grow in the river-scoured banks, and buffalo-nut (*Pyrularia pubera*), a parasitic shrub, in the rich mesic forest of the peninsula. We also hiked the Great Gorge Trail within the state park.

Steve Grund of the Western Pennsylvania Conservancy, Bonnie Isaac of the Carnegie Museum of Natural History, and Joe Isaac of Civil and Environmental Consultants served as field trip leaders in residence for the duration of the weekend.

On Friday evening, researcher Art Gover spoke about his ongoing invasive plant management activities at Ohiopyle State Park to protect the river scour habitat and special plants. Art Gover is a Research Support Associate with the Roadside Vegetation Management Research Project at Penn State University's Department of Horticulture.

On Saturday, Kevin Dodge led the group to Cranesville Swamp, a boreal peat bog located on the border of West Virginia and Maryland. Kevin is Professor of Wildlife and Biology and Director of the Natural Resources and Wildlife Technology Program at Garrett College, Maryland. Cranesville Swamp was formed 15,000 years ago during the last Ice Age. Glaciers, which came close to but never reached Maryland, caused the retreat of the boreal plants which remain to this day. The swamp, now owned and managed by the Nature Conservancy, is home to pockets of virgin forest as well as a variety of rare, endangered, or threatened species. Participant Ted Gordon, botanical consultant from New Jersey and a past president (1988–2000) of the Philadelphia Botanical Club, discovered in the bog a small occurrence of a disjunct species not previously documented in West Virginia, *Utricularia subulata* L., zigzag bladderwort. It was growing with a variety known as *U. subulata* var. *cleistogama*, pin-like bladderwort, once considered a separate species. Ted showed these plants to Steve Grund and requested him to deposit a specimen in both his and Steve's names at the herbarium at Morgantown, WV, or Carnegie Museum in Pittsburgh.

Participant Loree Speedy then led folks to the small but botanically significant Markleysburg Bog in Fayette County, PA for rose pogonia (*Pogonia ophioglossoides*) and golden club (*Orontium aquaticum*).

On Saturday evening, Steve Grund presented "A history of botanical exploration in Ohio, Fayette Co., PA." Located along two major railway lines, this botanically-rich area has been visited by botanists from the Pittsburgh region as well as other regions, since the early 1900s. The Torrey Botanical Society visited in 1905 and 1963.

Sunday morning, ecologist Lisa Smith led the group to Indian Creek Valley in a morning rain shower. The steeply descending Indian Creek flows southwest to the Youghiogheny River through a rich forest. This forest provides habitat for three plant species formerly or presently of state concern: mountain saxifrage (*Saxifraga micranthidifolia*), American bugbane (*Cimicifuga americana*), and Carolina tassel-rue (*Trautvetteria caroliniensis*), as well as a rich diversity of spring ephemeral species.

In the afternoon, Joe and Bonnie Isaac took a small group to visit the Spruce Flats Bog. The dominant feature of the area is the 28-acre bog, which contains large cranberry, pitcher plant, sundew, cotton grass, and other plants more typical of plant communities farther north. The origin of the bog is obscure. Past geologic activity, which may or may not have included glaciation, left a depression on top of Laurel Ridge which passed through natural succession from open water to marsh or swamp, to bog, to meadow and finally to forest. Early in the 20th century, lumbermen clear-cut the forest, and caused the water table to rise. Devastating fires at about the same time burned away the upper layers of organic matter, setting back the successional clock to the late swamp or early bog stage. Ted Gordon recorded the following species on a small segment of the bog adjacent to the boardwalk: *Acer rubrum*, var. *rubrum*, *Alnus serrulata*, *Amelanchier laevis*, *Calamagrostis coarctata*, *Carex atlantica* ssp. *atlantica*, *C. folliculata*, *C. lurida*, *C. stricta*, *Drosera rotundifolia* var. *rotundifolia*, *Eleocharis tenuis* var. *verrucosa*, *Eriophorum virginicum*, *Gaylussacia baccata*, *Ilex verticillata*, *Juncus canadensis*, *J. effusus*, var. *pylaei*, *Kalmia latifolia*, *Lycopodiella inundata*, *Lyonia ligustrina* var. *ligustrina*, *Maianthemum canadense*, *Nyssa sylvatica*, *Orontium aquaticum*, and *Osmundastrum cinnamomeum*.

Sunday evening, Joe and Bonnie Isaac presented "Peatlands of Southwestern Pennsylvania." A combination of the bedrock type and flat lying structure with localized depressions and spring fed streams are responsible for the formation of mountain bogs at the crest of ridges throughout the Allegheny Mountain region.

Attendance: 45 professional and amateur botanists, representing the states of Pennsylvania (15), New York (13), Massachusetts (3), Virginia (4), Ohio (3), New Jersey (3), Maryland (2), and Washington D.C. (2).

Report by chairperson: Mark Bowers.

18 June (Saturday): Franklin Parker Preserve, Burlington County, New Jersey.

The Franklin Parker Preserve covers over 10,000 acres in Chatsworth, New Jersey approximately 34 miles east of Center City Philadelphia, and is managed by the New Jersey Conservation Foundation. Much of the preserve is post agricultural cranberry bogs and blueberry fields that exist in various stages of succession.

Our trip began at the north gate near Chatsworth Lake and proceeded into the preserve to where the post agricultural cranberry bogs are located. In the past, pits and mounds were created in these bogs to add microtopography and have since been colonized by characteristic Pine Barren graminoids, shrubs and where ponded water exists, aquatic plants. Here we reviewed a map of the property and were given an overview of the hydrology and habitats found on the preserve by Russell Juelg, senior land steward of the Franklin Parker Preserve. We continued south and stopped to explore a pitch pine lowland and Atlantic white cedar

swamp. At this location we encountered *Sarracenia purpurea*, *Drosera intermedia* and *D. filiformis*. Upon exiting the swamp we found *Smilax laurifolia*, a state listed species. We continued along the sand roads of the preserve, stopping occasionally to investigate roadside plants or habitats of interest. Along the white trail we reached “Gentian Bend”, an area marked by white stakes that contained *Gentiana autumnalis*, *Calamovilfa brevipilis*, and *Xerophyllum asphodeloides* along with a diverse groups of woody shrubs and herbaceous perennials. Before returning to the north gate entrance where the trip began, we spent time visiting areas that were proposed to be included in a planned prescribed burn the winter of 2017. Additional species observed on the trip included:

Acer rubrum, *Andropogon virginicus*, *Aristida dichotoma*, *A. tuberculosa*, *Calamovilfa brevipilis*, *Chamaedaphne calyculata*, *Carex folliculata*, *C. pensylvanica*, *C. tonsa* var. *tonsa*, *Chamaecyparis thyoides*, *Clethra alnifolia*, *Comptonia peregrina*, *Diodia teres*, *Drosera filiformis*, *D. intermedia*, *Eubotrys racemosa*, *Gaultheria procumbens*, *Gaylussacia baccata*, *G. frondosa*, *Gentiana autumnalis* (S3), *Hudsonia ericoides*, *Hypericum gentianoides*, *H. spp.*, *Ilex glabra*, *Juncus canadensis*, *J. effusus*, *J. tenuis*, *Kalmia angustifolia*, *Leiophyllum buxifolium*, *Lobelia nutallii*, *Lyonia mariana*, *Magnolia virginiana*, *Morella pensylvanica*, *Narthecium americanum* (S2), *Nuphar lutea*, *Nymphaea odorata*, *Nyssa sylvatica*, *Osmundastrum cinnamomeum*, *Pinus echinata*, *P. rigida*, *Polygala spp.*, *Pteridium aquilinum*, *Pyxidanthra barbulata*, *Quercus alba*, *Q. marilandica*, *Rhexia virginica*, *Rhododendron viscosum*, *Rubus hispidus*, *Sarracenia purpurea*, *Sassafras albidum*, *Scirpus longii*, *Scleria pauciflora*, *Scleria spp.*, *Smilax glauca*, *S. laurifolia* (S3), *S. rotundifolia*, *Vaccinium corymbosum*, *V. pallidum*, *Xerophyllum asphodeloides*

Attendance: 15. Leaders: G. Russell Juelg and Ryan Rebozo. Report by the latter.

16 July (Saturday): Clayton/Glassboro Fish and Wildlife Management Area, Glassboro and Monroe Townships, Gloucester County, New Jersey.

The Clayton/Glassboro Fish and Wildlife Management Area (WMA; Figure 1) is nearly 3,000 acres of public open space surrounding the headwaters of the Little Ease, one of the major tributaries forming the Maurice River. It straddles three Gloucester County municipalities: Clayton, Glassboro and Monroe. The property is colloquially known as “CC Woods”, based on the short tenure of the federal government’s Civilian Conservation Corps camps that existed here during the Great Depression (1933–1939). The land entered public domain during the 1940’s and has been managed for wildlife for the past 70 years.

The management area is situated on an interesting set of natural landscapes that have developed into a variety of native plant communities. The management area sits squarely on the Outer Coastal Plain Physiographic Province, but not within the Pine Barrens ecosystem. It supports hardwood-dominated communities that are characteristic of the forests adapted to the Bridgeton Formation soils. While fire constitutes a major influence in shaping the forest community of the Pine Barrens, fire plays a far less significant role in the “CC Woods”. Here, human clearing or natural storm disturbances create the mosaic, and the fine, loamy soil texture provides a mesic setting unlike xeric geological landscapes east of this location.

Upland forests are oak dominated. *Quercus alba*, *Q. velutina*, *Q. falcata*, *Q. rubra*, *Q. coccinea*, and *Q. montana* are canopy dominants where upland soils exist. *Pinus rigida*, *P. echinata* and *P. virginiana* are present and found throughout the forest. Their presence, however, reflects past non-fire disturbances that created pioneer habitats suitable for pine seed establishment. Other canopy species found within the upland forest includes

Carya tomentosa, *C. glabra*, and *C. pallida*. Additional plots with a disturbance history are occupied by *Prunus serotina*, *Sassafras albidum*, *Juniperus virginiana*, *Liriodendron tulipifera*, *Acer rubrum* and *Populus grandidentata*. Sub-canopy trees include *Cornus florida*, *Ilex opaca*, and *Amelanchier canadensis*. Understory vegetation supports a heath layer that is dominated by dense thickets of mountain laurel (*Kalmia latifolia*). Ground cover heaths include the typical suite of shrubs found throughout the Coastal Plain where acidic conditions persist: *Vaccinium pallidum*, *Gaylussaccia baccata* and *G. frondosa*. The latter is the most prominent shrub of the three, and constitutes the signature heath shrub in the Bridgeton Formation's upland forests.

Wetlands within the WMA are palustrine forests dominated by deciduous canopies of *Acer rubrum*, *Liquidambar styraciflua*, *Nyssa sylvatica*, and *Magnolia virginiana*. *Chamaecyparis thyoides* and *Pinus rigida* are present within the wetland forest. Spungs and cripples are local names of landscape features found within the Little Ease wetlands.

The field trip focused on the northeast side of the management area. The botanists in attendance used a gas and electric power line right-of-way as points of access. The morning walk began on Fries Mill Road and proceeded west under a power line. The open habitat, bracketed by a surrounding oak forest, consumed a significant part of the trip. In the afternoon, the group worked the edge of Moore Avenue south to the same power line right of way. The land east of the roadway was botanized for about 100 meters before the trip ended due to excessive heat and a tired crew.

The power line's open habitat provided a long transect that was rich in Coastal Plain herbs. Here we saw a number of native upland grasses that included eleven *Dichanthelium* taxa, three upland *Danthonia* species, *Elymus virginicus*, *Panicum virgatum*, *Schizachryium scoparium*, and *Andropogon virginicus*. The group identified nine upland *Carex* species, four *Solidago* species and two *Lechea* species. An interesting find included both *Leersia virginica* and *L. oryzoides*, and our two creeping bush clovers, *Lespedeza repens* and *L. procumbens*. Except for *Desmodium paniculatum*, other common tick trefoil species were noticeably missing. The wetlands and lands in close proximity were likewise botanically productive yielding nine *Juncus* species, an additional seven *Carex* species, two *Xyris* species, and a number of southern New Jersey characteristic coastal plain grasses that included *Andropogon glomeratus*, *Calamagrostis cinnoides*, *Chasmanthium laxum* and *Panicum rigidulum* var. *pubescens*.

The open land under the power line also provided habitat for a few New Jersey Natural Heritage listed species: *Polygala polygama* (S2), *Polygala mariana* (S2), *Scleria pauciflora* (S2), and *Croton willdenowii* (S3).

Attendance: 7. Report by leader: Joe Arsenault.

24 July (Sunday): Crossways Preserve and Camp Woods Preserve, Montgomery County, Pennsylvania. Leader: Margaret Rohde.

Trip canceled due to excessive heat.

26 July (Tuesday): Haddington Woods, Cobbs Creek Park, Philadelphia County, Pennsylvania.

Haddington Woods is in the Fairmount Park system of Philadelphia. Haddington Woods parkland came to the city approximately one hundred years ago; previously the site was used variously for farming, industry, and mining (there is a surface quarry at the site). This park is part of a Philadelphia Parks and Recreation initiative to build deer exclosures

(this is also being done in two other areas of Fairmount Park: in the Pennypack and in the Wissahickon).

At one location in Haddington Woods there was noted regeneration of native plants (e.g., tulip poplar, red oak, white oak), and this location has been called the “good woods” and is included within a deer enclosure; another site is also enclosed. There was a fire in the “good woods” in mid-May 2015 (prior to construction of the deer fencing – the fire did not get into the canopy and the duff was burned <1 ”; the entire burn area was 1 to 2 acres in size).

On the day of the field trip, we saw *Bouteloua curtipendula* (in flower) by the parking lot (near 63rd Street), and *Wisteria frutescens* (with a glabrous fruit) down the path from the parking lot (past the quarry). *Lobelia inflata* was also growing along the path, as was a smallish *Celtis occidentalis* (it had strongly toothed leaves and very corky bark).

Silene stellata was in flower along the path running just west of the eastern deer enclosure. Also along that path (west of the eastern enclosure), there was a *Cryptotaenia*; due to its height (over 48” tall), we were unsure if it was *C. canadensis*.

Inside that enclosure (eastern), through the site that burned the previous year (May 2015), along the path running east-west through it, *Solidago caesia* was abundant, and *Desmodium* sp., and *Polygonum virginianum* were common. Also present were *Ageratina altissima*, *Apocynum* cf. *cannabinum*, *Aralia elata*, *Carex* cf. *blanda*, *C.* cf. *radiata*, *C.* cf. *swannii* (none of those carices were in fruit or flower), *Celastrus orbiculatus*, *Circaea lutetiana*, *Commelina communis* (very few — as compared to the prior year, when this was the dominant plant coming up in the herb layer after the burn), *Corylus cornuta* (it was hairy but not glandular), *Danthonia compressa*, *Elymus hystrix*, *Eurybia divaricata* (in bud), *Hackelia virginiana*, *Juncus tenuis*, *Liriodendron tulipifera* (seedling), *Microstegium vimineum*, *Muhlenbergia schreberi*, *Oxalis* sp., *Parthenocissus quinquefolia*, *Polemonium* sp., *Polygonatum biflorum*, *Polystichum acrostichoides*, *Prunus serotina*, *Quercus alba* (seedling), *Rubus* sp. (dewberry), *Sanguinaria canadensis*, *Toxicodendron radicans*, and *Viburnum prunifolium*. There were no clear dominants in this community.

Prunella vulgaris was flowering just along the enclosure fence, nearby to Cobbs Creek. There were very few ferns throughout the site — there was *Polystichum acrostichoides* in the eastern enclosure (closer to 63rd Street), and *Dennstaedtia punctilobula* in the western enclosure (closer to the golf course). Also, *Hypericum gentianoides*, which was in the western enclosure the prior year (2015), was not there this year (we searched the site for it, in the same location as it was found in 2015).

Attendance 5: Report by leader: David Hewitt.

06 August (Saturday): Manumuskin River Watership, Cumberland County, New Jersey. Joint trip with the Torrey Botanical Society.

The trip began at the former Manumuskin RR Station along Port-Cumberland Road, south of Cumberland and north of Port Elizabeth. In the open, sandy uplands along the railroad *Ipomopsis rubra* was noted in bloom. This species, native to the South, has been known from the Manumuskin RR Station since the late 1800s. The rare *Desmodium strictum* (just coming into bloom) was also noted here, as well as the non-native grass *Tragus racemosus*, which has now spread along the RR from the Manumuskin Railroad into the Millville Industrial Park over 4.5 miles SW of the RR station. Other species noted in the uplands included *Asclepias tuberosa*, *Baptisia tinctoria*, *Carya glabra*, *C. pallida*, *Crataegus uniflora*, *Cyperus grayi*, *Danthonia spicata*, *Dicanthelium depauperatum*, *Diodia teres*, *Diospyros virginiana*, *Euphorbia ipecacuanhae*, *E. maculata*, *Eragrostis curvula* (native to South

Africa), *Hypericum hypericoides* subsp. *multicaule*, *Krigia virginica*, *Lespedeza capitata*, *L. cuneata*, *Melampyrum lineare*, *Monarda punctata*, *Panicum virgatum*, *Petrorhagia prolifer*, *Pinus echinata*, *P. rigida*, *P. virginiana*, *Polygonella articulata*, *Pseudognaphalium obtusifolium*, *Pteridium aquilinum*, *Quercus alba*, *Q. ×brittonii*, *Q. coccinea*, *Q. falcata*, *Q. ilicifolia*, *Q. marilandica*, *Q. phellos*, *Q. stellata*, *Rumex acetosella*, *Schizachyrium scoparium*, *Setaria viridis*, *Strophostyles leiosperma*, and *Vaccinium pallidum*.

The group then walked along the RR to the Manumuskin River. Here above the RR bridge the group saw a fine stand of the federally-threatened *Aeschynomene virginica* in bloom in a freshwater tidal marsh dominated largely by *Zizania aquatica*. Other species noted in the marsh include *Amaranthus cannabinus*, *Apios americana*, *Bidens laevis*, *Cornus amomum*, *Decodon verticillatus*, *Cicuta maculata*, *Clethra alnifolia*, *Convolvulus hederifolius*, *Dioscorea villosa* (edge of marsh), *Hibiscus moscheutos*, *Ilex opaca* (edge of marsh), *I. verticillata* (edge of marsh), *Impatiens capensis*, *Juncus dichotomum*, *Leersia oryzoides*, *Lilium superbum*, *Lobelia cardinalis*, *Lyonia ligustrina* (edge of marsh), *Magnolia virginiana* (edge of marsh), *Mikania scandens*, *Peltandra virginica*, *Polygonum arifolium*, *P. hydropiperoides*, *P. sagittatum*, *Pontederia cordata*, *Rhododendron viscosum*, *Rosa palustris*, *Sagittaria latifolia* and *Thalictrum pubescens*.

The group then walked NW to the abandoned Fries Mill. This sawmill was founded in the 1770s and would take the name Fries Mill in the 1880s when the sawmill was purchased by John Fries. Besides the sawmill, the area included housing, a company store and a tavern. A large population of the non-native *Akebia quinata* was observed growing in the settlement area. Other species noted in the pine-oak uplands in the settlement area included *Asplenium platyneuron*, *Carex tonsa*, *C. pensylvanica*, *Chimaphila maculata*, *Cornus florida*, *Dicanthelium clandestinum*, *Galium circazaens*, *Gaultheria procumbens*, *Glechoma hederacea*, *Goodyera pubescens*, *Hieracium venosum*, *Juglans nigra*, *Juniperus virginiana*, *Lactuca canadensis*, *Lunaria vulgaris*, *Mitchella repens*, *Morus alba*, *Opuntia humifusa* s.s., *Parthenocissus quinquefolia*, *Verbascum thapsus*, *Viburnum dentatum*, *Vinca minor*, *Wisteria floribunda*, and *Yucca filamentosa*.

The group then traveled to Cumberland where it ate lunch. A dead immature screech owl was observed along the roadside by the pond. Along Rt. 49 near an old farm settlement, childhood home one of the leader's (Moore) grandmother, the group observed a stand of *Euonymus atropurpureus* in early fruit. This species is quite rare in New Jersey (S1), but the populations in this area are generally treated as non-native. A bog along the Lawrens Branch was then explored. There is evidence (mounding, ditching) that this bog was made by humans or at least greatly influenced by people, and there is a report that a grist stone was recovered from the Lawrens Branch (J. Jones in *Conservation Plan Manumuskin River Watershed*: 132. 1988). The bog was exceptionally dry this year. Species noted in the bog included: *Andropogon glomeratus*, *Bartonia paniculata* (edge of bog), *B. virginica* (edge of bog), *Carex collinsii*, *C. howei*, *C. intumescens*, *C. striata*, *Chamaecyparis thyoides*, *Chamaedaphne calyculata*, *Cladium mariscoides*, *Dicanthelium ensifolium*, *Drosera intermedia*, *D. rotundifolia*, *Dulichium arundinacea*, *Eleocharis olivacea*, *E. robbinsii*, *Eriocaulon compressum*, *E. decangulare*, *Eubotrys racemosa*, *Gaylussacia dumosa* s.l., *G. frondosa*, *Ilex glabra*, *I. laevigata*, *I. verticillata*, *Iris prismatica*, *Juncus acuminatus*, *Morella caroliniensis* s.s., *Nymphaea odorata*, *Oclemena nemoralis*, *Orontium aquaticum*, *Osmunda regalis*, *Rhexia virginica*, *Rhynchospora alba*, *R. fusca*, *Sabatia difformis*, *Sagittaria engelmanniana*, *Sarracenia purpurea*, *Schoenoplectus subterminalis*, *Utricularia juncea*, *U. striata*, *Vaccinium macrocarpon*, *Woodwardia aerolata*, *W. virginica*, *Xyris difformis*, and

X. smalliana. The group was accompanied by a (fittingly) single solitary sandpiper (*Tringa solitaria*) in the bog and a noisy juvenile red-tailed hawk (*Buteo jamaicensis*) overhead. An extensive population of the rare sedge *Rhynchospora inundata* was observed throughout the bog with thousands of stems present (additional stands of *R. inundata* were also present this year in open boggy wetlands further down the Lawrens Branch closer to its confluence with Cumberland Pond). This record was particularly noteworthy as one of the leaders has been visiting this bog off and on for almost thirty years without ever seeing *R. inundata*. This site also supports a population of the rare orchid *Arethusa bulbosa*, flowering specimens being observed earlier in the year by the leaders.

The group's last stop was NNE of the town of Hesstown along a powerline cut just E of Hesstown Rd. (Dorothy Road, Cumberland Co. Rt. 644). Here in the open uplands the group saw populations of two rare species, *Andropogon gyrans* and *Croton wildenowii*. Other species noted included *Carex swanii*, *Comptonia peregrina*, *Eurybia compacta*, *Eupatorium album*, *E. rotundifolium*, *Euthamia carolinianum* s.l., *Helianthemum canadense*, *H. propinquum*, *Hypericum gentianoides*, *Polygala nuttallii*, *Quercus ilicifolia*, *Q. marilandica*, *Schizachyrium scoparium*, and *Solidago odora*.

Attendance: 22. Report by leaders: Uli Lorimer and Gerry Moore.

03 September (Saturday): Black Run Preserve, Burlington County New Jersey.

The Black Run Preserve is a 1,300 acre preserve located in Burlington County, New Jersey approximately 18 miles east of center city Philadelphia. The preserve was established in 2012 and is owned by Evesham Township. The Black Run is located on the periphery of the New Jersey Pine Barrens and contains a mix of inner and outer coastal plain species. In the past, much of the preserve was part of an active cranberry operation, and later a portion of the current preserve housed effluent detention basins for a nearby development. Trails and signage in this preserve are managed by the Friends of the Black Run volunteer organization.

Our trip began at 10am at the blue trail and continued south east to the red then green trails, and ultimately followed the blue trail back to the meeting location. The walk began in pine-oak habitat where we encountered seven species of oaks along with two species of pines. This habitat transitioned into a pitch pine lowland that supports several species of shrubs including *Vaccinium corymbosum*, *Clethra alnifolia* and *Ilex glabra*. The trail side, post-agricultural bog habitat contained two species of *Drosera* in addition to cranberry and other typical pine barren bog species. Habitats encountered along this path include, pine-oak forest, post-agricultural cranberry bog, Atlantic white cedar swamp, open meadow and pitch pine lowland.

Along the path, one flowering plant and approximately 200 seedlings of *Elephantopus carolinianus* were positively identified. This is a species that is listed as SH, only known from historical records in the state. It was ultimately determined by the New Jersey state botanist in a subsequent visit that this occurrence was the result of a planting and not a natural occurrence. The trail continued to a small Atlantic white cedar swamp along the edge of an old cranberry bog that had dozens of *Xerophyllum asphodeloides* plants, none of which appeared to have flowered earlier in the year. Following the red trail lead us to decommissioned detention basins where *Phragmites australis* has established and some tree planting locations. This trail ultimately retuned back to the starting point.

Additional species encountered on the trip included: *Acerrubrum*, *Andropogon glomeratus*, *Asclepias syriaca*, *Betula populifolia*, *Carex pensylvanica*, *C. striata*, *Chamaecyparis*

thyoides, *Chamaedaphne calyculata*, *Clethra alnifolia*, *Comptonia peregrina*, *Cypripedium acaule*, *Dichanthelium* spp., *Drosera filiformis*, *D. rotundifolia*, *Elephantopus carolinianus*, *Fagus grandifolia*, *Gaultheria procumbens*, *Gaylussacia baccata*, *Hypericum* spp., *Ilex glabra*, *I. opaca*, *Iris prismatica*, *Juncus effusus*, *Juncus tenuis*, *Juniperus virginiana*, *Kalmia buxifolium*, *K. angustifolia*, *K. latifolia*, *Leucothoe racemosa*, *Lespedeza cuneata*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Lobelia nuttallii*, *Lyonia mariana*, *Nuphar lutea*, *Nymphaea odorata*, *Nyssa sylvatica*, *Osmundastrum cinnamomeum*, *Panicum virgatum*, *Phragmites australis*, *Pinus echinata*, *P. rigida*, *Plantago major*, *Platanus occidentalis*, *Polygala* spp., *Pteridium aquilinum*, *Quercus alba*, *Q. falcata*, *Q. illicifolia*, *Q. phellos*, *Q. prinus*, *Q. stellata*, *Q. velutina*, *Ranunculus bulbosus*, *Rhexia virginica*, *Rhododendron viscosum*, *Rhus copallinum*, *Sarracenia purpurea*, *Sassafras albidum*, *Smilax glauca*, *Smilax rotundifolia*, *Sphagnum* spp., *Taraxacum officinale*, *Trifolium repens*, *Vaccinium corymbosum*, *V. macrocarpon*, *V. pallidum*, *Xerophyllum asphodeloides*.

Attendance: 12. Report by leader: Ryan Rebozo.

10 September (Saturday). Aquatic Plant Primer: Wetland Plants of the Abbott Marshlands, Mercer County, New Jersey. Joint trip with the Torrey Botanical Society.

The Abbott Marshlands include a diversity of upland and wetland habitats. Overall there are about 1250 acres of wetlands. These feature the northernmost tidal freshwater wetland on the Delaware River where tidal range can exceed 10 feet. The tidal wetlands have been the focus of more than 60 ecological studies since the 1970s. These documented, for example, the high productivity of the tidal marshes as well as the diversity of annuals and perennial species. Study of a created tidal wetland along the Delaware River documented a tremendous dispersal potential and seed production by early colonizing species.

Preservation of the Abbott Marshlands began in 1937 with a local group being concerned about proposed development at White City Park, now part of Roebling Park. Ownership is complex, with Roebling Park owned by Mercer County; Northern Community Park by Bordentown Township; several unconnected properties, including the Bordentown Bluffs and the D&R Canal Tow Path trail, part of D&R Canal State Park, by NJ Department of Environmental Protection (DEP); highways by NJ DOT; light rail tracks by NJ Transit; and miscellaneous holdings by municipalities and private entities. In addition to its natural history, it has a Native American legacy dating back 13,000 years. Part of the marshlands are within both the Abbott Farm National Historic Landmark and within the Crossroads of the American Revolution. This site has been designated a Very Important Bird and Birding Area by NJ Audubon, and a Natural Heritage Priority Site by NJ DEP. Today there are about 3100 acres in public ownership. Information about the Abbott Marshlands can be found at www.abbottmarshlands.org.

The focus of this trip was to introduce the newcomer to common wetland species. The morning was spent at Spring Lake – Roebling Park, Hamilton, NJ where there were a number of easily accessed and common wetland species. For lunch the group moved to the Trenton Boat Launch on Lamberton Road, a freshwater tidal site along the Delaware River. A third site, also along Lamberton Road, featured dried tire tracks. Flowering plants are indicated by (fl) in the text below.

At Spring Lake, emergent aquatics included *Decodon verticillatus*, *Peltandra virginiana*, *Pontederia cordata* (fl), *Sparganium eurycarpum*, and *Typha latifolia*. Floating species included *Heteranthera multiflora* (fl), *Ludwigia peploides* (fl) and several duckweeds (*Lemna minor*, *Spirodela polyrhiza*, *Wolffia columbiana*, and *Wolffiella gladiata* (S1).

Nuphar lutea, with fall approaching, had both emergent and floating leaves. Two other emergents were *Sagittaria latifolia* (fl) and *S. rigida* (fl). Submergents encountered were *Ceratophyllum demersum* and *Utricularia* spp. Along the upland edge vines included *Apios americana*, *Dioscorea villosa*, and *Mikania scandens* (fl). Among the spore bearing plants were *Onoclea sensibilis*, *Botrychium* (=Sceptridium) *dissectum* and *Thelypteris palustris*, which all had fertile fronds.

In a swampy area, on the island past Spring Lake were *Lysimachia ciliata* and *L. terrestris*, as well as *Carex lurida*, *Eutrochium maculatum*, and *Lobelia cardinalis*. Wetland grasses included *Echinocloa walteri*, *Leersia oryzoides*, and *Zizania aquatica*.

At the tidal Delaware River edge at the Trenton Boat launch were *Bidens bidentoides* (fl, rare), *Helenium autumnale* (fl), *Justicia americana*, *Polygonum punctatum* (fl), and *Vernonia noveboracensis* (fl). Drift plants included *Heteranthera dubia* (fl).

At the Lamberton Road upland site, in once wet vehicle tracks, were *Ammannia coccinea*, *Cyperus difformis* (fl), and *Lindernia dubia* (fl).

Attendance 15. Report by leader: Mary Leck.

11 September (Sunday): Forsythe National Wildlife Refuge, Atlantic County, New Jersey.

Trip canceled.

04 December (Sunday): Franklin Parker Preserve, Burlington County, New Jersey.

On an early winter day, we went to the Franklin Parker Preserve to practice our winter plant identification skills. First, we stopped at a cedar swamp to see *Narthecium americanum* (bog asphodel), which was still recognizable from its racemes with seed capsules. We also botanized adjacent pitch pine woods and roadside. The plants recorded at this stop were as follows (with an asterisk marking plants that still had fruit): *Acer rubrum*, *Andropogon glomeratus**, *A. virginicus**, *Chamaecyparis thyoides*, *Chamaedaphne calyculata*, *Drosera filiformis**, *Dulichium arundinaceum*, *Eriocaulon decangulare**, *Eriophorum virginicum**, *Eubotrys racemosa**, *Hudsonia ericoides*, *Ilex glabra*, *Ionactis linariifolius*, *Kalmia angustifolia*, *Leersia oryzoides*, *Morella heterophylla*, *Narthecium americanum**, *Panicum virgatum**, *Pinus rigida**, *Pogonia ophioglossoides**, *Polygonella articulata*, *Pteridium aquilinum*, *Rhododendron viscosum**, *Sarracenia purpurea*, *Sassafras albidum*, *Schizachyrium scoparium**, *Scirpus cyperinus**, *Smilax glauca*, *S. rotundifolia*, *Symphyotrichum novi-belgii*, *Vaccinium corymbosum* s.l., and *V. macrocarpon**. Our second stop was a mature cedar swamp to see *Smilax laurifolia*, a thorny plant that sometimes goes by the colorful common name of blasphemy vine. Plants noted here (including the upland area we crossed) were *Bartonia virginica*, *Carex exilis*, *C. folliculata*, *Decodon verticillatus**, *Gaultheria procumbens*, *Lyonia ligustrina**, *Magnolia virginiana*, *Quercus ilicifolia*, *Q. marilandica*, *Q. stellata*, *Rhododendron viscosum*, and *Smilax laurifolia*. Our third stop was a particularly rich site known as “Gentian Bend” for the hundreds of *Gentiana autumnalis* plants (Pine Barrens gentian). Plants recorded here were *Aristida tuberculosa*, *A. virgata**, *Calamovilfa brevipilis*, *Clethra alnifolia*, *Comptonia peregrina*, *Dichanthelium* sp., *Gentiana autumnalis**, *Hypericum gentianoides**, *Leiophyllum buxifolium**, *Lyonia mariana**, *Pyxidanthra barbulata*, *Scleria pauciflora*, *S. triglomerata*, *Solidago puberula*, *Triadenum virginicum*, *Viola primulifolia*, and *Xerophyllum asphodeloides*. The fourth stop was an observation platform by Bald Eagle Reservoir. Around the observation platform are many plants atypical of the pinelands. The platform sits atop an old pump house constructed

of concrete blocks, which has influenced the surrounding flora; many plants atypical of the pinelands grow within 10 or so meters of it. The precise nature of this influence was investigated by preserve volunteers John and Rosanne Bornholdt, directed by Dr. Dennis Gray. The results were recently published (Bornholdt, J. W., R. Bornholdt, D. M. Gray. 2017. Alien plant species establishment is associated with reduced soil acidity in the vicinity of concrete block structures. *Journal of the Torrey Botanical Society*, 144: 328–338). Plants recorded around the platform and in surrounding wetlands were *Andropogon virginicum*, *Aronia arbutifolia**, *Clethra alnifolia**, *Eleocharis tenuis*, *Euthamia* sp., *Juncus biflorus**, *J. canadensis*, *J. dichotomus*, *J. pylaei*, *Lachnanthes caroliniana**, *Lycopodiella alopecuroides*, *Nymphaea odorata*, *Rhexia virginica**, *Rhynchospora* sp.*, *Rubus cuneifolius*, *R. hispidus*, *Scirpus cyperinus*, *Sparganium americanum*, *Symphyotrichum novi-belgii*, *Trichostema dichotoma**, and *Xyris* spp.* (apparently *X. difformis* and *X. torta*). The fifth stop was a sandy ridge that is presumed to be an ancient sand dune. The ridge was sparsely vegetated with plants, including *Minuartia caroliniana* (Pine Barren stitchwort). Our final stop was a wetland near an old borrow pit. The wetland appears to have been created by “turf cut,” i.e. removal of the vegetation and peat layer. Plants recorded here were *Bartonia virginica**, *Drosera filiformis**, *Dulichium arundinaceum*, *Eriophorum* sp.*, *Gaultheria procumbens**, *Ilex laevigata**, *Juncus scirpoides*, *Nuphar* sp., *Polygala lutea*, *Pseudolycopodiella caroliniana*, *Rhynchospora pallida**, and *Triadenum virginicum**.

Attendance: 21. Leaders: G. Russell Juelg and Janet Novak. Report by the latter.

Program of Meetings
January 2016–May 2018

Date	Subject	Speaker
2016		
28 Jan	An overview of the contributions of Bayard Long, curator of the Academy of Natural Sciences' herbarium (PH) from 1910 to 1969	Gerry Moore
25 Feb	Kin Structure and Mating System of the Veery (<i>Catharus fuscescens</i>) in the Mid-Atlantic Piedmont, with a Review of Nest Site Vegetation and the Use of Alien Plant Parts in Nest Construction.....	Matthew R. Halley
24 Mar	Agricultural Legacies in the Mixed Mesophytic Forest: Effects of Past Land Use on Forest Herb Communities	Marion Holmes
28 Apr	The Schuyler Lecture in North American Botany and Botanists: Conservation Status of Intertidal Plants in Mid-Atlantic Estuaries	Rob Naczi
26 May	The Disappearance of Butter and Eggs (<i>Linaria vulgaris</i>) from Center City	Kenneth Frank
22 Sep	Members' Reports on Summer Botanizing	
27 Oct	The Status of Rare Plant Protections in New Jersey	Ryan Rebozo
17 Nov	Beyond Honeybees: Beetles, Butterflies, Bumblebees, and Other Pollinators	Dan Duran
15 Dec	The Philadelphia Botanical Club: A History of Natural History	David Hewitt
2017		
26 Jan	Systematics and Evolution of the Grass Subfamily Arundinoideae, a Dustbin Taxon	Jordan Teisher
23 Feb	Plants of Southern Europe: A Visit to the Apennines, Sardinia, and Northern Greece	Janet Novak
23 Mar	Global Change Influences on Wetland Plant Invasions.....	Tom Mozdzer
27 Apr	The Schuyler Lecture in North American Botany and Botanists: The Beginnings of Botany in Michigan: From Thomas Nuttall (1810) to the Douglass Houghton Era (1830-1840)	Anton Reznicek
25 May	Trees of Philadelphia	Ned Barnard and Catriona Briger
28 Sep	Members' Reports on Summer Botanizing	
26 Oct	Bulbs of Turkey	Yasemin Konuralp
16 Nov	Building a Checklist and Mapping the Flora, Resetting the Bar for Maryland.....	Wes Knapp

14 Dec	The Gentle Green Shroud: Vegetation of Cemeteries and their Critical Role in Environmental Land Management.....	David Hewitt
2018		
25 Jan	Every Square Foot: Experimenting with Native Plants in the Home Landscape.....	John Janick
22 Feb	Seeing into the Future: The Plight of Plants and Ecosystems with Climate Change	Clint Springer
22 Mar	Lichens of Mercer County, New Jersey	Dennis Waters
26 Apr	Mid-Atlantic Megalopolis: Understanding Urbanization through Plant Specimens	Tatyana Livshultz and Cindy Skema
24 May	Environmental Niche Divergence in Southeastern Kalmia Species: Integrating Phylogeny, Community Composition and Ecology	Tesa Madsen-Queen

BARTONIA

Instructions to Authors

Types of Articles Published

Research papers communicate original research in plant ecology, plant conservation biology, plant systematics, and related topics. Other contributed papers convey the results of studies in floristics, distribution, methods, biography, bibliography, history of botanical exploration, and other topics of botanical interest. Short reports of one or two pages appear in “News and Notes.” Other items include obituaries, book reviews, and field trip reports. The focus is on the mid-Atlantic region (Pennsylvania, New Jersey, Delaware, Maryland, New York, Virginia, and West Virginia), but contributions of interest to *Bartonia* readers from farther afield are welcomed.

Manuscript Style

Write in simple, clear sentences. Use the active voice where possible. Avoid redundancy. *Bartonia* generally conforms to the Council of Biology Editors, Committee on Form and Style, *CBE Style Manual*.

Consult recent issues of *Bartonia* for style of main headings, subheadings, literature references, table and figure captions, and tables.

Double-space *all* text, including tables.

Do not justify the right margin.

Arrange manuscript copy in this order:

Name, address, e-mail address, and telephone number of corresponding author

Running head (shortest intelligible version of title)

Date of original manuscript submission

Title of paper

Name(s) of author(s)

Institutional address(es) of author(s)

Text of paper

Abstract

Introduction

Methods

Results

Discussion (may include Conclusions)

Literature Cited

Acknowledgments

Tables (with captions)

Figure captions

Figures: send each figure as a separate file using the any of the below formats (note the resolution requirements)

EPS (or PDF): Vector drawings, embed all used fonts/or set type to outline.

TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.

TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.

TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.

Manuscript Submission and Review

Submission of a manuscript implies that it is not under consideration in a similar form elsewhere. Authors should electronically send the manuscript with all tables and figures to the Editor. Manuscripts with multiple authors should be accompanied by a clear designation of the corresponding author, to whom all communication from the Editor should be addressed.

The Editor will select at least two reviewers for each manuscript and, on the basis of the reviews, decide on suitability for publication in *Bartonia*. The Editor will return manuscripts judged to require modification, along with suggestions for revision, to the corresponding author. Manuscripts not accepted for publication will be returned to the corresponding author.

Authors who have been asked to resubmit a revised manuscript should make the requested revisions and provide a brief rationale in a letter to the Editor for any reviewers' comments not complied with.

After a manuscript's final acceptance, authors will receive page proofs with a request to proofread and return them within one week of their receipt. At this time, authors also will receive a price schedule and order form for offprints and a page cost donation form, to be returned with payment to the Philadelphia Botanical Club.

SMITHSONIAN LIBRARIES



3 9088 02019 2290